THE

GEOGRAPHICAL MAGAZINE.

NOVEMBER, 1875.

JAMES GRAHAM GOODENOUGH.

(*Second Notice.*)

THE loss sustained by the country in the untimely death of Commodore Goodenough will be even more deeply felt as time goes on than it is at the moment; but the details which have now been received from Sydney bring the heavy blow vividly to our minds.

In the last two years, this well-loved officer, whose worth was already known to naval men and to geographers in this country and throughout Europe, had endeared himself to the people of Australia. The 'Pearl,' the frigate on which his broad pennant was hoisted, arrived in Sydney in August 1873; and in the two following years he won the hearts of all with whom he came in contact, and did much useful and earnest work. The Chaplain of the 'Pearl' thus describes Goodenough's aims in exploring the Pacific Islands, and the thoroughness with which he performed his great services in Fiji, to which we have already referred:—

"The Australian station may be divided into two parts—the pleasant part, Australia, New Zealand, Tasmania, where are fine climate, civilization, hospitality, and kindness; and the less pleasant part, the islands. The latter had a special charm for the Commodore. Imbued with the records of early discoveries, admiring Captain Cook as a true pattern of a discoverer, as brave yet prudent, high minded, accurate, truthful, the Commodore seemed to think it a worthy aim to try and supplement the discoveries of his great predecessor. Life to him was a time for work; he always wearied of ease and gaiety and pleasant times when there was work to be done elsewhere. He never tired of work. One work done, he sought for the next to do, never seeming to think rest possible with work undone. He threw all his energies, and they were great, both physical and mental, into the work at Fiji. The result has been now for some time public, but it seems well to know that his thoroughness would take nothing for granted. Personal enquiries and inspection guided him; he went from place to place, from island to island, seeing first one chief, then another; at one time going into the interior to try and hold personal communication with the mountain cannibals; at another visiting some plantations, testing sugar-cane, examining cotton, seeing everything for himself. So passed the months at Fiji, ascertaining the capabilities of the country, the feelings and dispositions of whites and natives, all the time with such a genial bearing, such courtesy and kindness to all, with such evident power and knowledge, with such entire candour and truthfulness, that all alike, white and coloured, honoured, trusted, loved him. Especially was he dear to the Fijian chiefs, who had implicit trust in the Commodore."

Missionaries throughout the South Seas have borne testimony to the sympathy and support they received from Commodore Goodenough. The cause of temperance in Sydney, and other ports of Australia, was forwarded by his personal example and public support. But he took the deepest and most special interest in measures for protecting and humanizing the natives of the islands of the Pacific. His last public act in New South Wales was the unveiling of the statue of Captain Cook at Randwick; a statue which had been erected to the memory of a brave man who met with a fate similar to that which brought Goodenough's own valuable life to an untimely end. At the opening of an eloquent and masterly address, which he delivered on the occasion, he spoke of Captain Cook's character in the following words:—"That life was an example of diligence, of industry, and of devotion to duty; and the character which became developed is one which shows perseverance, constancy, courage, and generosity." "How truthfully," observes a writer in Sydney who records this speech, "may these words now be applied to the officer whose praise is in every one's mouth."

In April, 1875, Commodore Goodenough had made a short cruise through the New Hebrides, doing much valuable surveying and other geographical work, collecting information, and making his office a real power felt for good throughout that part of the Pacific. Returning to Sydney, he conveyed Sir Arthur Gordon, the New Governor of Fiji, to Levuka. On the 17th of July 1875, Commodore Goodenough sailed from Levuka in the 'Pearl,' with the object of visiting the different islands of the New Hebrides and Santa Cruz groups, of conciliating the natives, and especially of acquiring full information respecting their relations with white men, by personal investigation and enquiry. A similar cruise had been made in 1871, by Commander A. H. Markham, now serving in the Arctic Regions, who visited most of the islands in H.M.S. 'Rosario', and performed a very difficult service with tact, judgment, and forbearance. Commander Markham's work, *The Cruise of the Rosario*, contains a full and detailed account of the islands which were the scene of Commodore Goodenough's latest services, and it is a source of comfort and satisfaction to know that the Commodore warmly approved of all the

proceedings of his younger brother officer, and old friend and shipmate in the 'Victoria,' to whom he was much attached. The 'Pearl' visited the islands of Ambroym, Mallicolo, St. Bartholomew, Espiritu Santo, and Vanikoro, where Commodore Goodenough and his officers were received in a friendly manner, and perfect confidence was established. On the 2nd of August the 'Pearl' sailed from St. Bartholomew Island and, after touching at Cape Lisburn, and the bay of St. Philip and St. Jago, the scene of the attempted settlement of Quiros, on Espiritu Santo Island, she went on to Mota or Sugar Loaf Island on the 9th, was at Vanikoro on the 11th, and arrived off Carlisle Bay, in Santa Cruz Island, on the 12th of August.*

The Commodore then landed, accompanied by some officers and men, in the hope of conciliating the natives, and opening friendly intercourse with them. The treacherous and blood-thirsty savages assembled on the beach, accepted presents with pretended friendliness, and were willing to barter. The Commodore entered their village, mixed freely with the people, and passed nearly an hour in apparently friendly intercourse. But when preparations were made to embark, a savage fired a poisoned arrow which struck the Commodore in the left side, and, before any arms could be reached, all of which were left in the boat, several flights of arrows were discharged on the party, wounding five men, and the Commodore again slightly, in the head. On returning to the ship, Goodenough resolved to show disapproval of this cowardly act of treachery by burning the houses of the village where the attack was made, but he gave strict orders that no life should be taken. A writer at Sydney truly says that "the nobleness of the late Commodore's character perhaps never so forcibly displayed itself as after the attack upon himself and those who were on shore with him. When it became necessary to impress upon the islanders a sense of their wrong doing, he gave orders that no life was to be sacrificed; that the village alone was to be destroyed." He thus received his death wound while engaged in a noble endeavour to conciliate and humanize a savage and treacherous people. The Commodore dictated the following despatch, reporting his proceedings, on August 13th, the day after he received the fatal wound, and signed it, without alteration, on the day before his death.

"Her Majesty's Ship 'Pearl,' at Sea,
"Lat. 25° 2′ S., Long. 159° 7′ E.
"*August 19th*, 1875.

"SIR,—I have the honour to report, for the information of the Lords Commissioners of the Admiralty, my proceedings since the date of my last general letter, dated the 31st of July, 1875.

"I left St. Bartholomew Island on the 2nd of August, and proceeded northward, calling at Cape Lisburn and St. Philip and St. Jago Bay, in Espiritu Santo, on the 3rd and 4th, Mota on the 9th, and Vanikoro on the 11th, and arrived off Carlisle Bay, in Santa Cruz Island, on the 12th instant.

"I wished particularly to communicate with Carlisle Bay, where the 'Sandfly' was attacked in September last year, in order, if possible, to open a friendly intercourse with the natives. I therefore steamed off the entrance of the bay in the 'Pearl,' and finding the harbour too small for the ship to enter I took two cutters and a whale-boat into a village fronting the entrance. I landed with precaution, accompanied by several officers, made some presents, and bartered with a few things the natives brought down. The natives were in good numbers. Several of them had put off from different parts of the beach in canoes, some of which met the boats on their way to the shore. After remaining on shore three-quarters of an hour, and feeling satisfied with the advances which had been made, I ordered the party to prepare to leave for the ship. Every person was in or close to the boats, except myself, Lieutenant Harrison, R.M.L.I., and my secretary, Mr. Perry, when a man, standing between two huts about 4 yards from me, fired an arrow which struck me on the left side. I turned at once to the boats, which shoved off, receiving at the same time two or three flights of arrows, which struck five of the men, and myself a second time on the head. To stop the attack a few shots from revolvers and rifles were fired, and the flights of arrows ceased, one native having been struck by our fire. I then proceeded on board. My first impulse was not to molest them; but on considering the case, and being satisfied, after inquiry, that no person whatever on our side gave the least provocation, I thought it better to send in four boats and burn the village where the attack had been made. The wounds appeared all slight; but as the arrows may be poisoned, and the cases may terminate fatally, I thought it best to proceed at once southward, more especially as the object of my cruise has been to gain personal information, and I shall now be unable, for some little time, to attend to my duties.

"I have, &c.
"(Signed) JAMES G. GOODENOUGH,
"*Captain and Commodore*
"*2nd Class, Commanding Australian Station.*"

"P.S.—The Commodore died on the 20th of August. I have thought it right I should state on this letter that it was dictated to me on the 13th of August, seen by the Commodore in its present state on the 14th of August, and signed by him as it was on the 19th of August—the day before he died. He wished to sign it without any alteration being made in the last paragraph as it now stands.

"(Signed) W. WYKEHAM PERRY, *Secretary.*
"*21st of August*, 1875."

The 'Pearl' at once proceeded to the island of Mota, or Sugar Loaf, to inform the missionary station of the occurrence, and on August 14th shaped a course southward for Brisbane, by the advice of Dr. Messer, the Staff-Surgeon, for the better recovery of the wounded. In the cases of the Commodore, and of two young ordinary seamen, aged 18, named Frederick Smale and Edward Rayner, the poisoned wounds proved fatal. As Goodenough lay in his cabin, and the last sad hours were passing, no murmur was heard to pass the lips of him whose loss was to cause such grief to others. The only regret he expressed, when he knew that his end was approaching, was that he had not strength enough to praise God sufficiently for all his mercies. He apologized to his officers for giving them so much trouble in watching beside his dying bed. He remained conscious to the end, giving to his officers his last fond messages to his bereaved widow and children, in a calm clear voice.

The Rev. James Payton, Chaplain of H.M.S. 'Pearl,' has written the following account of the last days of his beloved chief:—

"On Wednesday, the 18th of August, symptoms of tetanus appeared, and, in all human probability the Commodore must die. He seemed to grasp this fact in all its fulness, at once settling all earthly matters, in which he was thoughtful of every one dependent on him, and attended to the minutest detail of the command he was then called on to give up; then he fixed his thoughts on God. Without one earthly regret, with a perfect trust in the infinite love of God, with thankfulness for all the mercies he had received in his life, he resigned himself to the will of God. Till Friday evening he lingered among us, who, much as we always liked and respected him, in those few hours learned that we only then were apprehending his true greatness. On Thursday afternoon, thinking

* A good map of these islands will be found facing p. 213 of vol. xlii. of the *Journal of the Royal Geographical Society*; and also facing p. 304 of *The Cruise of the Rosario.*

that the end was near, he had all his officers summoned to his bedside, where in lovely and loving words, he spoke of his trust in the infinite love of God and the readiness he felt to go. He had a word for each, a word of love, as at his request each kissed him and said good-bye. He then caused himself to be carried on to the quarter-deck and placed on a bed there, the ship's company being assembled to hear his last words to them. He earnestly desired that no vengeance should be taken on the natives of Santa Cruz. In these last words to the men he spoke to this effect:—'We cannot tell their reason; perhaps they have been injured by white people, but we cannot communicate with them, not knowing their language; perhaps some day—it may be 20 or 30 years hence—some good missionary, some Christian man, may go among them and find out why they did this.' His heart was full of God's love to himself, and out of its abundance the mouth spoke. He spoke of this love, and exhorted all to love God, telling them how he had loved them all, even when having to punish them, seeing good in them to love. Many such words were spoken before he said good-bye, blessing them all in the name of God. A calm sleep followed after this exertion, and on waking his mouth still spoke the same things. He said that as a proof of God's love to him, instead of some dark picture of his past life rising up to trouble him at the last, God would only let his mind dwell on the words 'In whom is no variableness, neither shadow of turning;' he said God had opened, as it were, this little window in Heaven. He retained his consciousness to the last, his face even lighting up with a glorious smile when reminded of his 'little window.' It would be impossible, did one dare further to write publicly of so sacred a scene, to speak of his many loving words to all near to, of all away from him. Unselfish and noble, he even regretted that he was so long in dying, as it gave such trouble to those attending him. One of his last utterances was, 'I have no breath left to praise God for all his mercies.' He died quietly, at 5.30 P.M., on Friday, the 20th of August."

The two young seamen, Smale and Rayner, died, one on the same day as the Commodore, the other on the following day. The 'Pearl' arrived at Sydney on the 23rd, and the public funeral took place on Tuesday afternoon, the 24th, in the cemetery of St. Leonard's, at the North Shore.

The whole community of Sydney heard the sad news with feelings of sorrow and profound regret. Thousands of people assembled to pay their last mark of respect. At 2 P.M. the first minute-gun was heard from the 'Pearl,' and the procession started. It consisted of the seamen and marines of the 'Pearl' and 'Sappho,' followed by a gun-carriage bearing the coffin of the Commodore, and another with those of the two young seamen. Immediately following were Goodenough's two children, Leonard and William, accompanied by Commander Hastings of the 'Pearl' and the Hon. Algernon Stanley. Then followed Mrs. Goodenough, in Lady Robinson's carriage, and other carriages containing Sir Hercules Robinson the Governor, the Bishop of Sydney, the Ministers and Colonial Secretary, and the Chief Justice; the officers of the ships in harbour, and many others. The three graves lie side by side, that of the Commodore being in the centre. Goodenough's grave is near that of Captain Owen Stanley, the eminent surveyor and Arctic explorer, who died in 1850, when in command of H.M.S. 'Rattlesnake.' The service was read by the chaplain of the 'Pearl,' the Rev. James Payton, the benediction was pronounced by the Bishop of Sydney, and three volleys were fired by a company of men from the 'Pearl' and 'Sappho.' Several thousand persons accompanied the procession; for the loss was deeply felt throughout the colony. Some of that feeling has been expressed in various ways; and the following lines show how truly the life that has been taken from us was valued and understood, in the last scene of its labours:—

"Slowly the long procession moves, with solemn muffled sound,
Ere one of England's noblest men is laid in New World ground.
Yea bear him to the sailor's grave with every honouring rite,
Perished he yet more bravely than hero in the fight.
For when the utmost has been done that public grief can show,
Not half expressed the deep respect that in each heart must flow.
Ah, truly by such holy dead our virgin earth is blest,
We pray our sons may worthy be one day by him to rest.
Another martyr added to the heathen's cruel score;
One who, within the sailor's heart, Christ's healing mission bore,
A man of whom, nor yet *from* whom, ne'er one unloving word
Throughout his pure peace-breathing life by human ears was heard.
Not long he dwelt among us: but noble natures spread
Their influence quickly, and on all their hallowing radiance shed.
Of those who loved him, who can tell the burden of their cross!
And those who knew not still must mourn the country's deep-felt loss.
God of the world, thy ways are strange! Thou takest thus the man
Whose noble life would seem the most to help in Thy great plan
Of good for all Thine erring children—one whose very face
Spoke of strong Godward aim, with calm soul-winning grace—
A chief who held as holy charge all those within his power,
Who judged them souls—not mere machines—with the immortal dower
Of choice 'twixt good and ill, and led straight onward for the right,
Sparing not self, so he might guide by pure example's light."

THE ARCTIC EXPEDITION.

III.

LATEST NEWS AND FUTURE PROCEEDINGS.

(*Continued from p. 298 of our last number.*)

AFTER passing down the Waigat on the 17th of July, the Arctic Expedition reached Upernivik on the 21st, and, having shipped Hans and his family, proceeded on the voyage. The news respecting the weather, received from Mr. Krarup Smith and other Danish officials, had been encouraging. The last winter was very much colder in South Greenland than in the north, owing to strong westerly winds from America. In North Greenland the winter was unusually mild, and much ice kept drifting south until March. At Godhavn the mean temperature of the winter months was from 5° to 13° Fahrenheit higher than the average. But the spring was more severe than usual. The inferences were that an unusually large quantity of ice had been drifted out of Baffin's Bay, but that there was a check, owing to westerly winds, in the spring; consequently that the season of 1875 was favourable for navigation late in the summer, but not in the early part, and that it would have been a mistake for the expedition to have reached Melville Bay earlier than the latter half of July. We now know that these inferences, from the reports received at Godhavn, were well founded.

In facing the dangers generally encountered in Melville Bay, officers and men were fully prepared for the worst, and all the necessary arrangements had been made. In the event of a sudden nip destroying the vessel, provisions were placed in readiness on the upper deck, and haversacks were served out to every officer and man, with the names painted on them, each containing two blanket wrappers, one pair of boot hose, stockings, mitts, and drawers, mocassins, one jersey, one comforter, a Welsh wig, a towel, comb, and piece of soap. All officers and men were also told off to the different boats in the event of being forced to abandon the ship. The plans for the shape of a dock cut in the ice, and of the pieces to be sawn, were also drawn to scale, and officers and men were appointed to provide stores, to work at the different ice saws, and to prepare and ignite blasting charges, each with his special duty.

The expedition sailed from Upernivik at 8 A.M. on the 22nd of July, but soon a dense fog made it necessary to take shelter in a small bay near Kingitok Island, the northernmost of the settlements in Danish Greenland. Here the 'Alert' ran on a rock, and remained immoveable for five hours, getting off without any difficulty at high water. The fog having cleared up, the expedition shaped a course due west (true), for it had been determined, instead of creeping round the land-ice of Melville Bay, to make a dash through the middle pack. At 1 A.M. on Saturday, the 24th of July, the 'Alert' and 'Discovery' made the pack edge, and at once pushed into the ice, which was very loose, not more than 12 inches thick, and with lanes of water in all directions. Evidently all the ice formed during the winter had been drifted south by the northerly winds, and this new ice had been formed in the spring. It was an unprecedented open season.

In the afternoon of the 24th the first bear was sighted, and Commander Markham, with Lieutenant May and Dr. Moss, at once went in chase in the dingey, followed by Lieutenants Parr and Giffard and Captain Feilden; but bruin was too wary on that occasion, and the party returned, Lieutenant May having fallen through the ice. He was, however, none the worse for his cold bath.

At 11 A.M. on Sunday the 25th of July the 'Alert' and 'Discovery' got clear of the pack and entered the "North Water" of Baffin's Bay. The expedition had only been 34 hours in the ice, and 70 hours in going to Upernivik to Cape York. Former expeditions were 38 and 42 days struggling through the ice in Melville Bay, before they sighted Cape York. The 'Discovery' then went inshore to communicate with the natives, and endeavour to engage a brother-in-law of Hans as second dog-driver, while the 'Alert,' passing the Crimson Cliffs of Beverley and Cape Dudley Digges, proceeded to the easternmost of the Cary Islands,* which she reached at midnight of July 26th.

Two large depôts of 3600 rations each, being one month's provisions for 120 men, had been prepared, called A. and B., and were stowed on the upper decks of the 'Alert' and 'Discovery' respectively, ready for landing. Depôt A consists of 28 casks and 101 cases, as follows:—

Sugar	400 lbs.	Preserved potatoes	350 lbs.
Fine salt...	32 ,,	Pickled onions ...	111 ,,
Boiled beef	3636 ,,	Piccalilli	111 ,,
Stearine	395 ,,	Tea	60 ,,
Chocolate	230 ,,	Biscuit	2700 ,,
Pepper	10 ,,	Rum	55 galls.

One tin of beef weighs $7\frac{9}{16}$ lbs. including tare. Depôt B is the same as A in all respects.

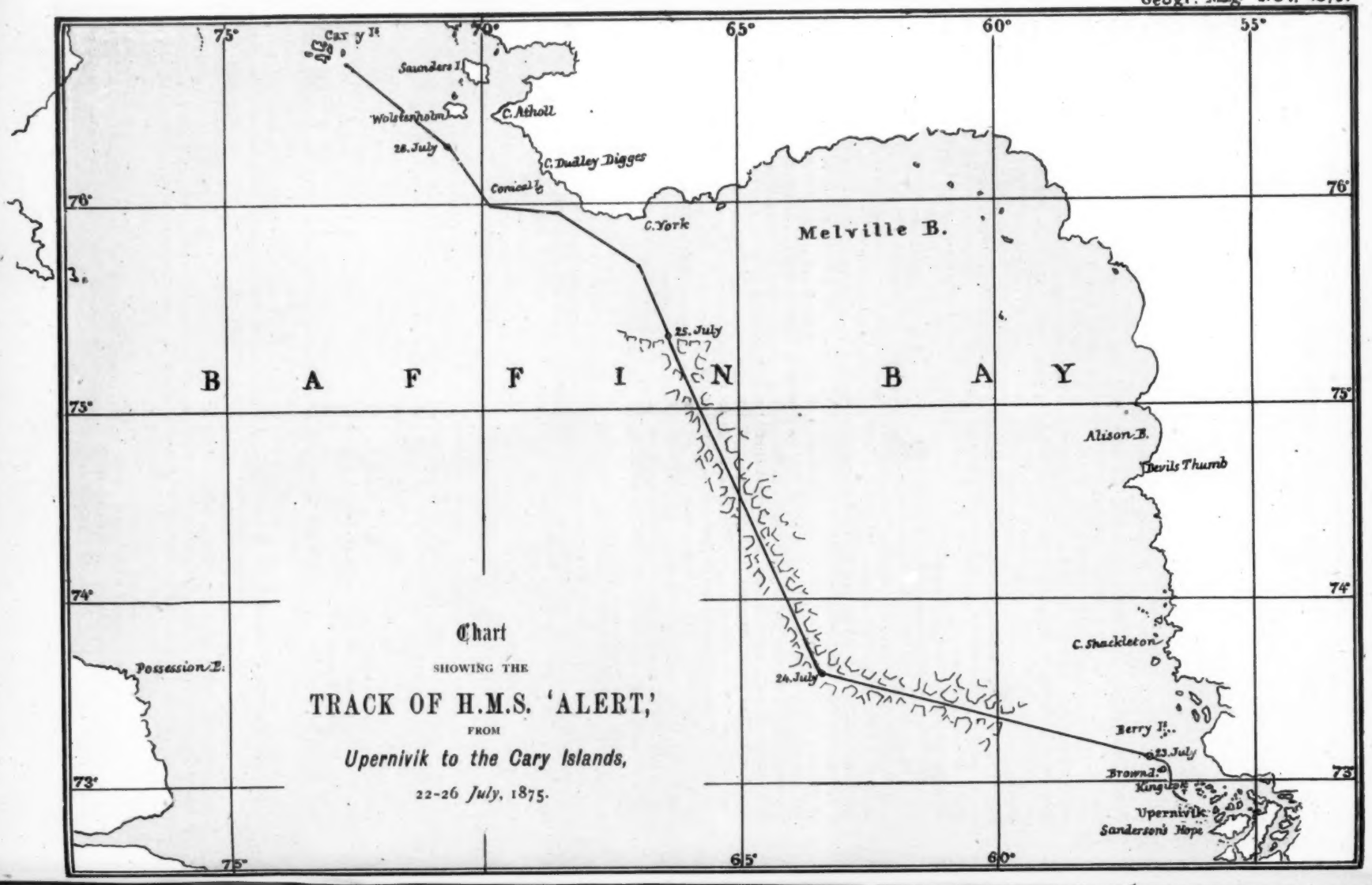
Depôt A, and the whale-boat supplied by the 'Valorous,' were landed on the easternmost Cary Island, with the record and letters which have been brought home by the 'Pandora,' during the night of July the 26th. The 'Discovery' here rejoined the 'Alert.' There was an extraordinary absence of floe-ice, and the long prevalent northerly winds, which Allen Young found still blowing in August and September, must have carried the old ice out of Smith Sound and Baffin's Bay in unusually large quantities, and probably caused an extraordinarily open season. The temperatures seemed to corroborate this view. On the 26th, that of the surface-water rose to 40° Fahrenheit, at 4 P.M., and was still 40° at 6 and 8 P.M. This was an indication that there was no more ice in the vicinity of the ships. At 6 A.M. on Tuesday the 27th of July, the expedition left the Cary Islands, and proceeded to Smith Sound, with the brightest prospect of an open sea, and of being able to obtain a high northern latitude. They had six weeks of navigable season before them.

A record was to be left at Sutherland Island, and, if the entrance was fairly clear of ice, also at Littleton Island on the east side. Sutherland Island is the position most easily reached by a vessel coming from the south, and Littleton Island from the north, as there is sure to be always much water in the narrow part of the channel. The ships were then to cross to the west shore of Smith Sound, and work their way to the north on that side. If there was much ice north of the Cary Islands, the principal cairn, with records, would be on Gale Point, south of Cape Isabella. The latest news will probably be found here, for if, as is likely, the 'Discovery' winters on the west side of the channel, it will be easier for her to communicate with Gale Point or Cape Isabella than with Littleton Island, owing to the difficulty in crossing Smith Sound. A boat was to be be landed at ———. Depôt B was to be landed probably at ——— on the western side with a a boat, and travelling depôts of 240 rations (20 days for 12 men) at three specified points south of the 'Discovery's' winter quarters, namely at ——— ———, and ———. Cairns were to be built near the depôts, with notices buried 20 feet magnetic north of them.

It was hoped that suitable winter quarters would be found for the 'Discovery' on the north shore of Lady Franklin Strait, in latitude 82° N., or a short distance further north. As soon as she was snugly established, a depôt of 10,000 rations was to be formed on shore, together with a supply of coals. Captain Stephenson would then at once throw out hunting parties, both to the shore and on the ice, to collect food for the dogs.

The 'Alert,' taking two officers and men for two sledge parties from the 'Discovery,' was then to have pressed onwards alone to the north. Depôts and

* In paragraph 4 of the Admiralty Instructions there is a passage to the effect that it may be worthy of consideration whether to leave a depôt and boat at the Cary Islands. This does not occur in the Report of the Arctic Committee.



Chart

SHOWING THE

TRACK OF H.M.S. 'ALERT,'

FROM

Upernivik to the Cary Islands,

22-26 *July*, 1875.

cairns would be landed, at intervals of about 60 miles, consisting of 480 rations each, or 40 days' provisions for 12 men. With these heavy undermanned ships, the surest way of reaching the Pole, in the opinion of Captain Nares, is not to risk failure by pushing forward away from the land. If the 'Alert' can winter even in 84°, and there is land ahead, there is the certainty of attaining a very high northern latitude by sledge-travelling, and of exploring the neighbouring coasts so as to be prepared to advance the ship along known shores during the following season. For Captain Nares considers a second season preferable to pushing off away from the land, and thereby risking a winter in the drifting pack, whence all chance of exploring is at an end. Consequently if the land north of Cape Union trends westward, with a navigable sea, but no land in sight to the northward, Captain Nares has made up his mind to remain by the shore for the first winter. Then, with increased knowledge of the trend of the land, the direction of the prevailing wind, and the currents, and having ensured certain communication with the 'Discovery,' the 'Alert' can push boldly northward in the summer of 1876. If, however, there is continuous land to the north, the 'Alert' will be taken this summer to as high a northern latitude as is possible.

In preparing to face the sufferings and hardships of an Arctic winter, there will be urgent necessity for considering the question of heating and ventilating with great care. For the ships have not been fitted with any warming apparatus, as was the case in previous Arctic expeditions. There are the galley fire and the ordinary service stoves. The stoves are of three sizes, large, medium, and small; the medium stoves having a lifting top, which supplies a hot plate for warming water. Round the funnel of the galley there is a reservoir for receiving ice and snow for water, which is drawn off through a tap below. There will be small stoves for the fore peak and sick bay: a medium stove in the fore part of the lower deck; two large stoves in the after part of the lower deck; a large and a medium stove in the ward-room, and a medium stove in the captain's cabin, all with copper piping passing along the beams, but contributing little or nothing to the heating of the air below them. There is also a small portable drying stove. The calculation was that 1½ cwt. of coal would be used each day, or 25 tons a year, for cooking and warming; 80 lbs. were allowed for the galley; 14 lbs. for the large stoves. But this is altogether insufficient. The galley fire requires 100lbs. at the very least, the large stoves 28 lbs., and the mediums 15 lbs. during the summer. In winter this allowance must be largely increased. The stoves alone will prove inadequate either for the due warming or the wholesome ventilation of the ships; and the officers will be thrown on their own resources to devise some improvement. Mr. White has already suggested a plan which will probably be tried. He would have a funnel open at the top to the outer air, passing through the upper deck and the lower deck, and then up through the lower deck again so as to form a syphon. It will then pass through a large stove so as to heat the fresh outer air, and out a few inches above the deck, where there would be a valve to regulate the outflow of the pure hot air, which would then rise, and diffuse warmth while expelling the bad vapours. Sir George Back also furnished a valuable suggestion to Commander Markham and Lieutenant Beaumont. In the 'Terror' he secured healthy ventilation by the use of a wind-sail, bell shaped at the mouth, brought down to within a short distance of the deck. It is very important that these or some other equally good plan should be adopted, for success entirely depends on the preservation of health and good spirits during winter quarters.

There will be no want either of occupation or amusement in the long darkness of at least 120 days, that the explorers must encounter. The observatory for magnetic observations has been taken out in pieces from England, with no iron in any part, and a copper stove has been supplied for it. This wooden edifice will be erected on shore, if the ship succeeds in finding winter quarters in a harbour, and there will be another observatory for the astronomical observations. Thus the scientific staff will be steadily at work through the winter, while the instruction and amusement of officers and men will be fully provided for. There will be schools for teaching navigation and other branches of knowledge. A large collection of excellent magic-lantern slides furnishes the means of illustrating lectures on astronomy, as well as amusing tales and anecdotes. The ships are badly supplied with Arctic works, but in other respects the forethought of friends and well wishers has furnished an excellent and judiciously selected library, which has been catalogued and classified. The expedition is rich in musical talent, and each ship has a piano and a harmonium. Lieut. Aldrich is an accomplished pianist, Lieutenants May and Egerton play the banjo, and there is a talented drum and fife band on the lower deck, besides any amount of vocal music fore and aft. Commander Markham, with Mr. Egerton as a confederate, will give entertainments of magic and legerdemain, and can perform all conjuring tricks from the magic bottle to dark *séances* and clairvoyance. The histrionic talent is also in strong force on board both ships: many presents of dresses and properties were received, including one from Mr. Irving, and a magnificent proscenium has been painted for the 'Alert.' There will also be periodical literature and newspapers, besides printed play bills and notices; the printing department being ably conducted by Lieutenant Giffard and Robert Symons. Nor has due provision for such festive occasions as birthdays and Christmas-tide been forgotten, and numerous plum-puddings and cakes, many pounds of mince-meat, and boxes containing bottles of punch, together with the nine sheep, supply the means to both officers and men for their celebration.

The importance of the duties of making the winter pass quickly and pleasantly away, by amusing as well as employing the minds of all on board, and preventing their caring for the inevitable hardships and sufferings; as well as by strictly enforcing the proper amount of daily exercise and the observance of sanitary regulations, cannot be over-estimated; and every member of the expedition, by cordially and heartily entering into the spirit of the work, will, each in his place, thus secure the maintenance of the general health both of mind and body. It is this alone that can ensure that

elasticity and vigour which, in the spring of 1876, is destined to carry the crosses of St. George far into the unknown north.

As the sun begins to approach the horizon the grand work of the expediton will commence. The object will be to reach the Pole, and, on the return of the supporting sledges, much will be done in exploring nearer the ships. In our number for March 1875, p. 65, we gave some general details respecting the English naval system of Arctic sledge-travelling; but it is important, with a view to a proper understanding of the means by which this great national achievement is to be done, that geographers should be fully acquainted with the exact details of sledge-travelling as arranged for the present expedition.

For each ship there are two 12-man sledges, six 8 and six 5-man sledges, three satellites and 1 ladder-sledge for glacier travelling; of the following dimensions:—

The 12-man sledge has 7 uprights 19 inches apart. It is 14 feet long, 3 feet 5 inches wide, 1 foot 2 inches high, and weighs 182 lbs. 8 oz. complete with drag-ropes and bottom.

The 8-man sledge has 6 uprights 18 inches apart. It is 11 feet long, 3 feet 2 inches wide, 11 inches high, and weighs 122 lbs. 14 oz.

The 5-man sledge has 4 uprights 15 inches apart. Its length is 8 feet, width 2 feet 8 inches, height 8 inches and weight 5 lbs.

The tents are of light close unbleached duck. That for the 12-man sledge is 14 feet long at the bottom, and 10 at the top, 7 feet wide on the ground, 7 feet high, and weighs 41 lbs. The tent-ropes are 6 fathoms long, of 1½ inch, and the tent-poles of ash 10¾ feet long.

The 8-man tents are 9 feet 4 inches long at the bottom and 8 at the top, 7 feet wide and high, and weigh 31 lbs. 14 oz. The tent-ropes are 6 fathoms long of 1¼, and tent poles (weighing 5¼ lbs.) are 8 feet 6 inches long. The 5-man tent is 7 feet long by 6 feet 6 inches wide and high, weight 22 lbs., the tent-ropes 5 fathoms of ¾ inch, and length of tent-poles 7 feet 10 inches.

The tent furniture (consisting of coverlet, lower robe, floor cloth, sail, trough, and bottom) weighs 61 lbs. 3 oz. for an 8-man tent, 52 lbs. 10 oz. for a 5-man, and 96 lbs. 6 oz. for a 12-man tent. The sleeping-bag, 6 feet 8 inches long, weighs 8 lbs. 2 oz.

The clothing for each man, on starting, consists of:—

1 flannel or wove woollen frock
1 thick guernsey frock
1 duffle frock (1 spare)
1 pair of duffle trousers
1 duck jumper and trousers
1 pair of worsted stockings (1 spare)
1 pair of thick wove woollen drawers (1 spare)
1 pair of blanket feet-wrappers (2 spare)
1 pair of wadmill-boot hose (1 spare)
1 pair of smoked moose-skin mocassins (3 spare)
1 pair of mitts (2 spare)
1 drag belt of light horse girth (5 ft. long by 3 in.)
1 Welsh wig (1 spare)
1 cap, veil, and face cover
1 comforter (1 spare)
1 tin water-bottle to hold ½ of a pint
1 gutta-percha cup
1 pair of coloured spectacles
1 pair of canvas boots (2 spare)
Towel and soap
The weight of the knapsack (17 inches wide, 12 high, and 6 deep, weighing 9 oz.), including spare clothing, is 12 lbs.

* For a description of the sledge flags of the different officers, mottoes, &c., see the *Geographical Magazine* for June, 1875, pp. 172-173.

The daily allowance of food to each man, while travelling, will be 1 lb. of pemmican, ¼ lb. of bacon, 14 oz. of biscuit, 2 oz. of preserved potatoes, 1½ oz. of chocolate, ½ oz. of tea and sugar, 1 oz. (½ a gill) of concentrated rum, 55 above proof; besides 1¾ oz. of salt, ¼ oz. of pepper, 1 of onion powder, and 3 of tobacco a week. The weight of one ration is 2 lbs. 11 oz., of 20 rations 59 lbs. 2 oz.; and of 160 rations, or 20 days' provisions for 8 men, 473 lbs.

For depôts the pemmican cases are 20 inches long by 10½ by 7½, weighing 56 lbs. full, and 8 lbs. empty. The depôt tins of bacon weigh 52 lbs., and are filled up with 8 lbs. of tallow, weight 12 lbs. empty. A depôt of seven days' provisions for 8 men weighs 201 lbs., and can all be stowed in one cask weighing 90 lbs., total weight 292 lbs. There are also waterproof depôt cases of gutta-percha pressed upon coarse duck.

The cooking apparatus consists of a kettle resting on and fitting to the lamp, which is fed by alcohol or cocoa-nut stearine—six pints a day of spirits of wine, or 1 lb. of stearine. The largest sized kettle holds 13 pints, and its lamp of 10 wicks requires 9 oz. of alcohol or 5 oz. of stearine for boiling. The next size holds 9 pints, and also has 10 wicks (6 oz. of alcohol and 3 of stearine to boil). The third size holds 6 pints (4 oz. of alcohol and 2 of stearine) with 7 wicks, and the smallest holds 3 pints, with a lamp of 5 wicks, needing 2 oz. of fuel to boil.

The supply of medicines and surgical appliances for the travelling parties has received the most careful attention from Dr. Colan; and he will give instruction on the subject to each officer commanding a sledge. At first he was only allowed a weight of 8 lbs. for medical stores, which has been extended to 12 lbs.; and the following is the list for each sledge, to be made up in a tin case (20 inches by 5 and 7) and a medicine tin for bottles (7½ inches by 5¾) together weighing 4 lbs.

MEDICAL STORES FOR EACH SLEDGE.

	oz.	dwt.
Salvolatile and aromatic spirits of ammonia (2 phials)	3	0
Laudanum (2 phials)	1	4
Wine of opium (2 phials)	1	0
Gregory's powder (small tin)	1	0
Dover's powder (12 papers of 10 grains each)	0	2
Chalk powder (32 papers of 15 grains each)	1	0
Sugar of lead (30 papers of 4 grains each)	0	2
Turpentine liniment (bottle)	6	0
Carbolic acid (phial)	1	4
Glycerine ointment in oiled silk	6	0
Simple or white ointment	3	0
Carbolic plaster	1	0
Purgative pills (4 dozen in phials)	0	4

	oz.	dwt.	gr.
3 calico bandages	3	4	0
2 flannel bandages	6	0	0
Lint	6	0	0
Oil silk	1	0	0
Sponge	1	0	0
Pins in paper	0	1	0
Expanding splints (2) and carbolized tow	20	0	0
Fine tow or cotton wool	3	4	0
Catheter	0	1	30
Tourniquet	6	4	0
Truss with pad	8	4	0
Lancet	0	1	0
Quill	0	0	10
Persian gauze	0	4	0
Eye-shades (2)	0	4	0
Small splint	0	1	0
Scissors	0	1	0
Flannel ice-goggles in metal case	0	7	0
Tape	0	1	0
Mustard (in paper)	0	4	0

	lbs.	oz.	dwt.
Total weight of medicines, &c.,	7	11	40
Weight of cases	4	0	0

The weight of the sundry bag has also been increased from 8 lbs. to 12 lbs. It contains slow match, palm and needles, senit and twine, nettle stuff, nails, tent-brush, chopping-axe, spare hide, 2 spare cross-bars. Then there are pannikins holding 1¼ pint

for each man, large horn-spoon, spirit measures, funnels, and daily rum can.

The sledge, tent and furniture, clothing, cooking gear, sundry and medicine bags, &c., form the constant weights, which do not alter, and it is of the utmost importance to keep them as low as possible. The calculation for the constant weights for the different sledges is as follows:—

CONSTANT WEIGHTS.

	12-man sledge. lbs.	oz.	8-man sledge. lbs.	oz.	5-man sledge. lbs.	oz.	2 men and dogs. lbs.	oz.
Tent, complete	41	0	31	4	23	4	23	4
Tent poles	39	4	22	5	22	5	22	5
Sledge, complete	182	8	122	12	56	0	64	0
Bottom	3	12	3	6	1	10	—	
Trough	12	0	8	4	5	2	5	5
Sail	11	0	9	1	7	2	—	
Floor cloth	16	0	11	4	8	9	8	2
Lower robe	25	0	18	4	14	4	16	0
Coverlet...	28	2	21	0	15	8	—	
Sleeping-bags	97	8	67	0	40	10	16	4
Knapsacks	144	0	96	0	60	0	24	0
Shovel and pick	12	0	12	0	12	0	10	0
Cooking gear..	24	7	20	5	15	0	8	0
Small cooking apparatus	20	5	15	0	—		—	
Ammunition...	16	0	16	0	8	0	8	0
Gun..	7	0	7	0	7	0	7	0
Sundry bag	12	0	12	0	6	0	6	0
Instruments	13	0	13	0	—		—	
Medical stores.	12	0	12	0	12	0	12	0
Luncheon bag.	12	0	9	0	5	0	5	0
Saw and 5 snow-knives.	5	0	5	0	5	0	—	
Sail gear..	5	0	5	0	—		—	
Pemmican chopper. ...	3	0	3	0	3	0	—	
	741	14	539	13	327	6	235	4
Weight for each man ...	67	5	77	1	81	13		

To the constant weights must be added that of 40 days' provisions, the largest amount that can be carried on one sledge. Each ration weighs 2 lbs. 11 ozs. For a 12-man sledge there will be 480 rations, weighing 1290 lbs. or 107½ lbs. to each man, which added to 66 lbs. constant weights makes 173½ lbs. for each man to drag, of course getting less every day as the provisions are consumed. For an 8-man sledge there will be 320 rations, weighing 810 lbs., or 100 lbs. for each man, which added to his 77 lbs. constant weights makes 177 lbs. for each to drag. For a 5-man sledge there will be 200 rations, weighing 537½ lbs., or 107 lbs. for each man, or, added to 81¼ lbs. of constant weights, makes 188¼ lbs. for each man to drag. It will, however, be chiefly the 8-man sledges that will make the long journeys, with a load of 40 days' provisions.

The conveyance of a boat, with the long travelling parties, in the event of meeting open water, is a measure of the greatest importance. The sledges for carrying boats have the two end cross-bars fitted with two cleats, one on each side of the boat's keel. These cleats are 7 inches long, and are securely lashed to the cross-bars. Two battens of American elm, each 2 inches wide and half an inch thick, are lashed in a fore-and-aft direction to the top of the cross-bars 3½ inches apart, that is to say 1¾ inch on each side of the central line of bearer. They are sufficiently long to allow of their being secured to all the cross-bars. When the boat is placed on the sledge the keel rests on the cross-bars between the cleats, and is held in an upright position by four cushions of stout canvas, stuffed with cork cuttings, the whole being kept in place by lashings. Two parts of inch rope are passed through the cork fenders to keep them in shape. The weight of the 20-foot boat on a 14-foot sledge, prepared for travelling with 4 paddles only, is 1006 lbs.; of the 15-foot boat on an 11-foot sledge, 706 lbs.

Great assistance is often derived from the use of a sail on the sledge, which materially eases the labour of dragging. Two tent-poles are lashed together as a yard, with a spare pole as a foot yard. The other two poles are used as sheers, and at their ends a mast-head iron or sheer head is fitted, consisting of two rings united by a piece of iron about 3 inches long, from the centre of which there is a hook on each side for the steadying guys, and a small block for the halyards is seized on to the iron between the rings. A spare cross-bar (with a span seized along its top side, and the bights, with a thimble in each, projecting just beyond the cross-bar) is placed on the trap of the lading, over the midship upright, and lashed down to the bearer. The ends of the sheers are then stepped into the thimbles attached to this cross-bar; and the sail hoisted. On smooth ice, with the wind aft or on the quarter, a sledge will travel under sail at a good pace.

Such are the arrangements which the results of long experience have shown to be best for Arctic travelling. It has been stated that a better system might be introduced by imitating that of the Hudson's Bay Company's traders in North America, but the circumstances are entirely different between the Company's territory and the true Arctic Regions north of the 70th parallel, both as regards the country, the weather, and the men. Sir James Ross and Sir Leopold M'Clintock, the founders of Arctic sledge-travelling, were fully informed respecting the methods of the Hudson's Bay Company's traders, and would have adopted them if they had been suited to the conditions of the Arctic Regions north of 70° N., but they are not. The flat Hudson's Bay sledges were tried in the autumn sledge-travelling of 1850, and were found to be worse than useless; while the snow huts are only necessary during intense cold, when they will be used, as they were by Sir Leopold M'Clintock.

The spring travelling of 1876 will probably commence about the 1st of April, and the main attempt will be made by six sledges and 52 men, an arrangement which will only leave ten in the ship, including officers. This fact proves how short handed the expedition really is. In our number for June 1875, p. 172, we described the flags and other cognizances of the officers commanding sledges, six of which will be seen fluttering in the breeze on some distant ice field, in the early days of next April. The object of all will be to enable one sledge to approach the North Pole, by advancing to the north for 56 days and attaining a distance of 500 miles from the ship.

The grand achievement will be done by a system of depôts and auxiliary sledges. Let us call the sledges A, B, C, D, E and F, five of 8 men, and one of 12 men, the object being to enable A to advance singly to the Pole. All start with 40 days' provisions, F (the 12-man sledge) consequently having 480 rations, and the other five 320 rations. After five days F has 432 rations left, and requires 60 to go home. He fills up the other five sledges (who by that time are down to 288 rations) to 320 rations again, leaves 176 rations at the Depôt I, and returns (assuming they all

started on April 1st) on April 10th. He then comes out again to Depôt I., consuming 120 rations out and home, and leaves 360 rations, making 536 at the Depôt. After another five days (10 days in all) E, in like manner, fills up the four other sledges to 320 rations, leaves 128 at Depôt II., and returns to Depôt I. with the 32 that are left to him. He there fills up to 320, goes back to Depôt II. with 288, leaves 256 there, making 384 in all, and goes home.

Two depôts, at distances of five and ten days from the ship, are now stocked with 216 and 384 rations respectively, and four 8-man sledges are loaded with 40-days' provisions each, at a distance of ten marches from the ship.

Sledges D, C, B, and A, then advance for 5 more days (15 in all), and find themselves with 280 rations. D fills up the other three sledges to 320, and keeps enough to take him back to Depôt II. (128 rations), leaving 120 rations at Depôt III. He takes enough at Depôt II. to take him to the ship, and returns home. Three sledges then advance for ten days (25 from the ship), when they have 248 rations left. Sledge C fills up the two others to 320 each, leaves 120 at Depôt IV., and goes home, taking 40 at Depôt III., 40 at Depôt II., and 40 at Depôt I. B and A then go on until they are 36 days from the ship, when A is filled up to 320 rations, and left to do battle with the unknown obstacles ahead single handed. B leaves 80 rations at Depôt V., takes up 48 at Depôt IV., 40 at Depôt III., the same at the other two, and so reaches the ship.

Sledge A is now 36 marches from the ship, and filled up to 40 days' provisions. He presses onwards to the North Pole until half are consumed, when he will be 56 marches from home on about May 26th; and, we may hope, at the goal. He returns to Depôt V. in 20 days more, when all will be consumed. But he there finds 80 rations left by B, which take him to Depôt IV., where he picks up 48, at Depôt III. 40, at Depôt II. 40, at Depôt I. what more he requires, and so returns to the ship after an absence of 112 days. No one, who is without experience of Arctic travelling, can realize the hardships, dangers, and sufferings that these brave men will encounter and overcome. If ever heroes deserved well of their country for upholding her fame, and battling for her interests, assuredly our dear friends, now far away in the unknown region, will take their places among the foremost. Anxiety for them we cannot but feel, but it may be softened by well-founded hope, and by confidence in their prudence and ability.

As the earlier sledges return, they will be able to do much exploring and collecting work, as well as hunting, at shorter distances from the ship; and we may hope that much oxen, reindeer, and birds will be abundant.

Then other officers, including Dr. Moss and Captain Feilden, will probably lead short sledge parties, and display their flags, while performing very useful work. The dogs will chiefly be used in keeping open communications, with the 'Discovery'; and the two officers, with their sledge crews, belonging to the 'Discovery,' on board the 'Alert,' will return to their own ship, to be met half way by parties from the 'Discovery,' who will advance as far as 84° N., and remain until May 15th at least.

The spring sledging work of the 'Discovery' will be important, and forms an indispensable portion of the scheme. Her parties will continue the exploration of the north coast of Greenland, and a depôt will be formed beyond Cape Stanton. A party will go to Hall's grave and examine the stores. Another, with dogs, will communicate with the post at the entrance of Smith Sound, and leave despatches and letters there. It is fully expected that some vessel will go to the entrance of Smith Sound to communicate and receive news, in the summer of 1876; and a boat will probably be sent down by the 'Discovery' during the autumn.

The probability of passing a second winter in the ice, and of not being able to complete the work until 1877, has been considered. If no news is obtained of the 'Alert,' by the 'Discovery,' in 1876, Captain Stephenson is to make a second attempt to communicate in 1877. But if there is still no news, the 'Discovery' is to land all provisions that can be spared, and to go home in August 1877. For it may then be concluded that the 'Alert' has advanced nearer to Cape Bismarck than to Robeson Channel, and may be expected to come out on the east coast of Greenland.* The relief ship, which is to go out in 1877, must, if the 'Alert' has not been heard of, winter at the entrance of Smith's Sound. If the 'Discovery' cannot get out before August 1877, she is to endeavour to communicate by boat or otherwise with the relief ship, and the officers and crew are to abandon the 'Discovery' early in 1878, leaving her in a safe position, and as habitable as possible.

But, if all goes well, the 'Alert' and 'Discovery' will complete their perilous but glorious mission without accident, and return home in the autumn either of 1876 or 1877.

IV.

THE CRUISE OF THE 'PANDORA.'

THE object of the expedition fitted out by, and at the expense of Captain Allen Young, R.N.R., and Lieut. Fred. G. J. Lillingston, R.N., was to proceed up Baffin's Bay, to execute such exploring work as might be possible, and especially to attempt to reach King William Island, and make a more thorough search for the relics of the 'Erebus' and 'Terror.' They also intended, if possible, to bring home late news of the Arctic Expedition. Although Captain Allen Young was fully prepared for a winter, he had no intention of risking detention, unless he succeeded in reaching such a position as would enable him easily to make a thorough examination of King William Island, with the snow off the ground.

A suitable vessel for the purpose was found in the 'Pandora,' a gunboat purchased from the Government, of 430 tons, and engines of 80 nominal horse-power with a lifting screw. She was well-strengthened for Arctic work at Southampton, barque-rigged, and, when heavily laden, she has a draught of water of 12 feet. She has 8 boats, including a small steam-launch and 3 complete whale-boats. The 'Pandora' hoisted the white ensign of the Royal Yacht Squadron.

The complement of the 'Pandora' was 31 officers and men all told. Captain Allen Young is well

* Paragraph 17 of the Admiralty Instructions states that final separation is possible owing to a sudden or unforeseen movement of ice resulting in the 'Alert' being carried down the eastern shores of Greenland. This is not in the Report of the Arctic Committee.

known as the companion of Sir Leopold M'Clintock in the 'Fox,' and one of the most persevering and daring of Arctic travellers. Lieut. Frederick G. J. Lillingston, R.N., is a young officer who is deeply interested in Arctic work; and the third executive English officer was Navigating Sub-Lieutenant George Pirie, R.N., an accomplished young surveyor, who was a volunteer for the Indian Marine Survey Department. Through the intervention of Commodore Jansen, Lieutenant Koolemans Beynan, of the Royal Dutch Navy, an observant and very promising officer, also joined the 'Pandora,' with a view to acquiring experience in ice navigation. He had recently returned from the Sumatra squadron, in which he has been for the last two years, including service with the naval brigade on shore at Achín. The other companions of Captain Allen Young were Mr. McGahan of the *New York Herald*, whose excellent work, describing his visit to Khiva, was reviewed in our number for July, 1874, p. 158; Mr. de Wilde, an artist; Dr. Horner, the surgeon; Messrs. Ball, Porteous, and Jones, the engineers; Mr. Mitchell, the boatswain; Mr. James, the carpenter; and Mr. Henderson, the harpooneer. Mr. Henry Toms, quarter-master in the 'Fox' during her memorable voyage in 1857-59, joined his old shipmate as gunner of the 'Pandora.' Joe, the Eskimo, the faithful companion of Captain Hall, came over from New York to join the 'Pandora'; and there were seventeen seamen, including Thomas Florence, aged 61, who like Mr. Toms had served with Captain Allen Young in the 'Fox.'

The 'Pandora' sailed from Plymouth on the 28th of June, 1875, and, like the Arctic Expedition, encountered head winds and a succession of heavy gales from the west and north-west. On the 9th of July, she lost her jib-boom. The first ice was seen on July 28th, in 58° 50′ N., and 45° 30′ W., and on the next day a fresh breeze from the S.E. took them into Davis Strait. Passing through the stream of Spitzbergen ice, the 'Pandora' reached open water close in-shore, and arrived at Ivigtot, the port for the cryolite mine in South Greenland, on the 1st of August. Here Allen Young purchased and took on board 20 tons of coal, and, sailing the next day, he discovered an extensive reef on the coast of Greenland in 66° 12′ N., and 53° 42′ W., about 42 miles south of Holsteinbourg Harbour, where H.M.S. 'Valorous' was then repairing damages. The 'Pandora' arrived at Godhavn, in Disco Island, on the 7th of August, encountered a gale of wind in Disco Bay on the 8th, obtained a good team of dogs at Ujarasussuk, took in 40 tons of coal in 12 hours at the Ritenbenk Kulbrud, and proceeded down the Waigat Strait into Baffin's Bay on the 10th of August. On the 13th of August the 'Pandora' arrived at Upernivik, but only stopped an hour to purchase more dogs.

Melville Bay was found to be in a most extraordinary state. Excepting a few bergs, there was not a piece of ice of any description to be seen, in the very place where, at this time of August, the 'Fox' was beset and forced to winter. On the 16th, the 'Pandora' passed Cape York and the Crimson Cliffs of Beverley, of which the artist made some fine sketches, and arrived at the Cary Islands, having had to beat against a strong northerly gale. Captain Allen Young landed the mails for the Arctic Expedition on the north-west island, but he did not find the letters for home on that occasion, as they had been placed, with Depôt A, on the easternmost island of the group. He found however the remains of the cairn, with the record, erected by Mr. Clements Markham of H.M.S. 'Assistance' on the 21st of August 1851, on the site of an older cairn on which was a piece of wood with the date 1827 cut on it. Captain Young also found two other cairns, built by whalers in 1867 and 1869. The 'Pandora' then ran before a northerly gale for Lancaster Sound, killing two bears and capturing one alive off Cape Horsburg. But on entering the Sound on August 21st, a barrier of ice was found to extend across from Cape Warrender. At last an opening was found along the southern shore, and the 'Pandora' reached Beechey Island on the 25th, where the house built by Captain Pullen in 1854, when in command of the 'North Star,' was found to have been broken into by bears, and the depôt was much injured by them. The stores were surveyed and put in order, the house again made secure, and Mr. de Wilde, the artist, made several sketches and took photographs of the graves of the 'Erebus' and 'Terror's' men. Captain Allen Young weighed the same evening, and shaped his course for Peel Sound.

On the 28th, after some difficulties with fogs and ice-floes, the 'Pandora' entered Peel Sound and passed the furthest point reached by the 'Fox' in 1858. There was not a particle of ice to be seen to the south, and the 'Pandora' steamed along the coast of North Somerset, all on board being full of hope of reaching King William Island without a check. In the evening they were off the part of the coast where Sir James Ross had built a cairn at the furthest point reached during his memorable sledge journey, with M'Clintock, in 1849. Captain Young landed on Sunday, the 29th of August, found the record left by Ross, and deposited one in its place. The 30th was a lovely day, the waters of Peel Sound were as smooth as glass, and the explorers were rapidly approaching Bellot Strait. The land on either side had first been examined and laid down by Allen Young himself, during his arduous journey in the spring of 1859. They reached Roquette Island, only 10 miles north of Bellot Strait, but only to find an impenetrable field of old ice stretching from shore to shore. At this point the 'Pandora' was 150 miles from King William Island, too great a distance for examining its shores in July and August, when the snow is off the ground (which was the aim of the expedition), and getting back to the ship before the navigable season was over, without danger of being detained a second winter. The 'Pandora' was only provisioned for one winter: it, therefore, became necessary to return, with a view to preventing a ruinous waste of power and resources, and to making another attempt next year. This first trial had been gallantly made and was, on the whole, encouraging. The 'Pandora's' voyage was already a most remarkable one.

Captain Young reluctantly turned from the scenes of his former labours and triumphs, as it was obviously impossible to approach nearer to King William Island during the navigable season. With some difficulty the 'Pandora' retraced her steps out of Peel Sound and Barrow Strait, and, before returning home, it was resolved to make another attempt to find the letters of the Arctic Expedition at the Cary Islands. After

beating up from Lancaster Sound, against a northerly gale, the 'Pandora' arrived off the south-east Cary Island on the 11th of September, and sighted the cairn built by the 'Alert.' For some reason, not yet explained, the cairn was placed, not on the north-west island where Mr. Markham's cairn stood, and to which Captain Young had been requested to go, but on this south-east island. Lieutenants Lillingston and Beynan landed, and brought off the letters and records, and the 'Pandora's' head was then turned south. They reached Disco again on the 20th of September, passed Cape Farewell on the 2nd of October, and, running before a fierce north-west gale, the 'Pandora' arrived safely at Spithead on the 16th of October.

The cruise has been extremely interesting and instructive, and has been most useful in giving experience of ice navigation to the young officers; while complete harmony and good feeling prevailed fore and aft. The 'Pandora' has penetrated far down Peel Sound, to a point never before known to have been attained by any vessel, and Captain Allen Young, at considerable risk, has performed a great and valuable public service in bringing home the letters of the Arctic Expedition. We heartily congratulate him, his officers and men, on the results of the voyage, and trust that it may not be the last they will make together in the regions of the north.

A GLANCE AT THE RESULTS OF THE EXPEDITION TO HISSAR.

By Herr P. Lerch.

(*Translated from the "Russische Revue," No. 8 for September* 1875).

We have now to add a new item to the manifold and by no means inconsiderable services which the chief of the General Government of Turkistan had already rendered to our geographical knowledge of Central Asia. The expedition to Hissár, composed of three members, Messrs. Vishniefski, Mayef, and Schwartz, completed its task some six weeks ago, and has thus thrown open that territory to scientific geography. It lies, we need hardly say, in the western part of the Upper Basin of the Oxus, and is at present subject to the Amîr of Bokhara; but our knowledge of it till now has been most scanty, and in part derived from very ancient notices, for no modern European traveller had ever trodden its soil. Whilst the Iskandar-Kúl Expedition, which the Governor-General, in 1870, confided to the guidance of General Abramof, then examined the Upper Basin of the Zarafshán, the present mission to Hissár has made an exploration of the hill-country traversed by the more westerly tributaries of the Oxus on its right bank, and has by astronomical determinations, so to speak, annexed the territory to the domain of our atlases. The accounts which we have till now possessed of this region were founded in part on native reports, and in part (as we have just mentioned) on old historical notices. And we shall now indicate these as a suitable introduction to the precursory report of the Results of the Expedition, which we derive from the *Turkistan Gazette*, No. 28 of the present year.

It is in Chinese sources that we find the earliest notices of the hill-country which extends from the south of Kesh, the modern Shahr-i-sabz, to the Ámú or Oxus at Termedh, over against Balkh. In 629 Hwen Thsang, a Buddhist pilgrim from China, impelled by the desire to visit the cradle-land of his Faith, and to study its sources on the spot, travelled to India by way of Transoxiana; and on that journey went from Samarkand through Kesh, which he calls *Kishwangna*, to Termedh (*Tami*). His description of this district is to be found, more or less abridged, in the Chinese historical and geographical compilations of the time of the Thang dynasty, which reigned from the beginning of the 7th till the beginning of the 10th century; the relations of China to the western countries of Central Asia dating back to the 2nd century B.C.* Even previous to the middle of the first century of the Hijra, the Arabs were already pressing into the Oxus Highlands, but the notices of those campaigns that have come down to us afford hardly the slightest information regarding the politics or ethnology of those regions, and very little indeed as to their topography. We learn only that the territory north of the Ámú, and to the westward† of Termedh, was called Saghánián, and had then a prince of its own. The first to give us more detailed notices of those tracts, as well as of the countries generally on the Oxus and Jaxartes, were the two famous geographers of the 10th century, Istakhri and his friend Ibn Haukál. Nor here should we omit to mention Ibn Dasta, a geographer somewhat earlier than those two, but with whom we have but recently made acquaintance. Sir Henry Rawlinson, it is well known, has quoted from him an extract regarding the course of the Oxus, but has done so with considerable abridgment, as I have been able to satisfy myself by a transcript of the passage made for me last year from the MS. in the British Museum, by the kindness of one of our own scholars, Professor Khwolson. The geographical work of the able Mokaddasi, belonging also to the 10th century, has not yet been published, but we shall not have to wait for it long, as it will form the 3rd volume of the *Bibliotheca Geographicorum Arabicorum*, now under publication by Professor de Goeje at Leyden. The first two volumes of this important literary undertaking contain the works of Istakhri and Ibn Haukál. What is imparted on the countries in

* The narrative of Hwen Thsang is to be found in the *Voyages des Pèlerins Bouddhistes* published by the late Stanislas Julien of the French Academy. The notices from historical sources will be found translated into Russian by Father Hyacinth Bitschurin in his *Collection of Notices regarding the Nations of Asia*, &c., vol. iii., pp. 246-247. The same notices of this region are found in the work of Matwanlin, a learned Chinese of the 13th century, and have been published by Abel-Rémusat (*Nouvelles Mélanges Asiat.*, tom. i., pp. 238-239; see also *Magazin Asiatique* i. p. 121, and Klaproth's map therein of Transoxiana from Chinese sources). The recent judicious editor of *Marco Polo*, H. Yule, has followed the examples of Cunningham and Vivien de St. Martin in subjecting the whole of Hwen Thsang's notices on the regions of the Upper Oxus to a new critical examination in a special article, (see *Notes on Hwen Thsang's account of the Principalities of Tokhâristân*, in the J. R. As. Soc. N.S., vol. vi. pp. 92-120, with map). Another work of the same writer is sufficiently well known—*Essay on the Geography and History of the Regions on the Upper Waters of the Oxus*, published as an introduction of the new edition of John Wood's narrative of his Journey to the Sources of the Oxus, undertaken between 1830-1840. This instructive paper has been translated into Russian by Mme. Olga Fedtchenko, and accompanied by the notes of her late husband, as well as by a new map (see *Russische Revue*, 1873, Bd. iii. pp. 185-187).

† [This should be *eastward*.]—*Y.*

which we are now interested by the still earlier Arab geographers El-Yakúbi (end of the 9th century), and Ibn Khordádbah (middle of the same) is but scanty in comparison with the authorities just noticed, and consists of brief itineraries, the value of which is still further diminished by the uncertainty of the readings of names. The later works of the opulent Arabic geographical literature afford us no new matter whatever.

It was not till the beginning of the 15th century that a European traveller planted his steps on a portion of the hill-country which has been explored by our recent expedition. This was Ruy Gonzales de Clavijo, on his journey as the ambassador of Henry III. of Castille, to the court of Timur. He crossed the Oxus at Termedh, and travelled thence by the famous Iron-gate to Kesh, and on to Samarkand. His itinerary in this tract agrees with the routes which we find in the Persian works on the history of Timur (such as those of Sharifuddin 'Ali of Yezd, Abdurazzák of Samarkand, and Mirkhond). These latter works also afford, regarding the regions to the eastward of the route in question, some geographical data, which have by no means been turned to full account by our geographers. Next we have Sultan Baber, who travelled all about the country in the beginning of the 16th century, and has shed some glimmerings of light on the geography of the Hissár territory in that vivid autobiography of his. From the latter part of the same century we also derive some particulars, which are handed down to us in the very detailed history of a warlike Prince of Transoxiana, Abdulla Khán, which was compiled in Persian under the title of *Sharifnámah-i-Sháhi* by a court historiographer, and the publication of which has been undertaken by a member of our Academy. Abdulla Khán conducted campaigns against Hissár, Kuláb, and Badakhshán. To the middle of the 16th century also belong the Wanderings of a Turk, cast astray in this direction, and whose memoirs were published in a German version so long ago as 1815, by H. F. von Diez in the 2nd vol. of his *Denkwürdigkeiten aus Asien*.* The author, Sidi 'Ali Kátib Rúmi called his book *the Mirror of Countries*. In the 10th and 11th chapters he describes his adventures in the mountains of the upper basins of the Ámú and the Zarafshán: Fedtschenko has made use of the very brief itineraries of this narrative in his notes to Yule's Essay.

But a more recent source of information regarding Hissár, which dates from the middle of last century, has remained hitherto unknown. This is a historical work called *Tárikh-i-Rahim-Khání*, which I first discovered during my stay in Bokhárá, and which treats of the history of Mahommed Rahim, the first Khan of Transoxiana of the Mangít Dynasty, and nephew of Daniel-Bi, the progenitor of the family now reigning in Bokhárá. Rahím Khan fought for the supremacy of his own tribe, with several of the other Usbek tribes, such as the Yúz and the Kúngrát in Hissár, and the Kanagess in Shahr-sabz. The book deserves to be translated into some European language, or anyhow to be published in the Persian original, for it contains numerous ethnographical and geographical data, and describes the occurrences of a period in the history of Transoxiana which is otherwise scarcely known. A second copy of the work was brought to St. Petersburg two years ago by Mr. N. P. Pietrovski, formerly agent of our Finance Department in Turkistan. The copy which I brought home for the Asiatic collection of the Imperial Academy of Sciences is unluckily defective at the end. The concluding part of the work consists of the history of Daniel-Bi.

As we have already remarked, the territory of Hissár, explored by our recent expedition, was never before trodden by any European. But Europeans in adjoining countries have collected notices about these uplands, such as Meyendorff, Macartney (in Elphinstone's work on Kábul), Burnes, and Khanikoff. Within the last ten years Hissár and Shar-sabz were visited by Faiz Bakhsh, a native of India, in the service of the Anglo-Indian Government, during his journeys in Eastern and Western Turkistan. His narrative has been published by H. Yule in the *Journ. R. Geog. Soc. of London*, vol. xlii.*

The following preliminary Report has been published in the *Turkistan Gazette*, under the title of "Short Notices of the Results of the Expedition to Hissár," and I append to it a few notes derived from the older documents which I have mentioned. We shall be better able to judge of the value of these older notices when we shall be in possession of a map based on the researches of the expedition, and of the detailed reports of its members. The present report, we cannot but observe with all its brevity might have been a little more explicit. It affords us no general orographical sketch of the country, and touches only isolated geographical particulars. (Sd.) P. Lerch.

The expedition explored the western part of the Hissár hill-country in two lines of direction: (1) from Karshi by Khuzár,† Kushlush, Tangi-Khoram, Darband, Sir-ab, and Lailakán to Shir-ábád; and then (2) from Chushka-Khuzár (on the Oxus) by Shirábád, Lailakan, the Valley of Kudukli, and Pitau, to Baisun.‡ These journeys established that the rivers Khuzár-Darya and Shirábád Darya were not the insignificant streams that they had hitherto been taken for. They are the means of life to two very considerable oases, those of Khuzár and of Shirábád. It has also proved Fedtschenko's

* [Also given in French, in the *Journal Asiatique*, 1st Ser. vol. ix.].—*Y.*

* [The learned author has made some slip here. Faiz Bakhsh has not given any narrative of a journey in Hissár.]—*Y.*

† I cannot make out why our Turkistan geographers, as well as the anonymous author of the Notices, write *Huzár*. The Oriental authorities, from Ibn Haukál's "Routes and Realms" down to the history of Rahim Khán, write the initial of the name always with the guttural *Kh* (with the dot above). In the list of the 16 cantons of Kesh (written by the Arabs with double *sh*), detailed by Ibn Haukál and Istakhri, there is a canton (Rusták) of *Khuzár*, and one of the *River Khuzár* (*Khuzár Rúdh*). To the first of these are assigned the towns Sunáj, Naukád-Kuraish, and Eskifaghan. The Khuzár Rúdh is most certainly what is now called the Khuzár Darya. According to the Arab geographers just cited, the Province of Kesh had an extent of four days' journey in length, and as much in breadth. The Khuzár River is given as 8 farsakhs distant from the city of Kesh, which according to the Chinese notices (*Hyacinth*, iii. 247) was built in the beginning of the 7th century. It joined, along with Táj-Rúdh and the Khoshk Rúdh, another river which flowed by Nasaf (in Persian pronunciation Nakhshaf, *i.e.* Karshi). Between Nasaf and Kesh were three stations; from Nasaf to Naukád-Kuraish the distance was 5 farsakhs, or some 27 miles.

‡ [Of these names we find in Colonel Walker's last 4-sheet map (June 1875); Khozar, Kosh Ulush, Darband (south of Saráb), Saráb, Sherábád; and again Chushka *Ferry* (Guzar?) Sherábád, Baisun.]—*Y.*

notion that the Khuzar-Darya had its sources in the gorge of Tashkurghan to be erroneous; for the stream from this gorge is the Kizil-su, which discharges into the Kashka River near the village of Karábágh. As regards the Khuzár River, it is formed by the union of the Katta-Uru-Darya with the Kchi-Uru-Darya; the first of which rises among the glaciers of the Sengri-dagh, and the last in those of the mountains of Baisún.

The banks of the Katta Uru-Darya are very thickly populated, and among those hill-people there are folk very well to do, and possessing flocks of 2000 to 3000 sheep, and herds of 500 to 1000 camels. In summer these Uzbeks quit their settlements in the valleys, and betake themselves, with their flocks and herds, to the mountains, where they find, near the margin of the snows, fresh grass for their beasts throughout the summer, so their settlements remain deserted in summer time and show no signs of life again till the beginning of autumn. When winter comes the inhabitants of these places drive their flocks to the Desert* of Karshi where there is comparatively less snow, and where the luxuriance of the *Salsolaceae* affords the animals capital winter fodder.

The expedition first followed the road to Baisun. After passing the wide Chakcha Valley, they beheld in front of them the gorge so famous under the name of the Iron-Gate, known now to the natives as the Buzgola-Khána or Goat house. Till now this spot was known only by name, for the only travellers who have given us any notices of it—and those but vague at best—were a Buddhist missionary of the 7th century (viz. the Chinese Hwen Thsang), and the Spanish envoy to Timur's Court (Ruy Gonzales de Clavijo). Both travellers speak of this gorge as of a very notable natural phenomenon. The first tells us that it was closed by a folding gate cased with iron and hung with bells. As long as the art of war was still in a low stage of development, such a gate might indeed bring a whole army to a stand. But Clavijo, who travelled through this country some 800 years later found the gate no longer to the fore. He only describes the pass as an impregnable position. But the exact site of this pass it has not yet been possible to identify from the descriptions of either the Chinese or the Spaniards.†

Fedtschenko thought (see his notes on Yule's Essay on the Upper Oxus) that the Iron-Gate was not to be sought on the bridle-path of Khozár, but further west on the carriage-road; but the members of the expedition have, on the contrary, established that the Iron-Gate is to be found on that part of the water-shed where the road from Shahr-sabz (the Kalta-minár Road), and that from Karshi (the Khuzár Road) join, not far from Darband.* There is indeed no such thing as a carriage road to Hissar.

At a distance of 3 *tásh*† from Darband, and separated from that place only by the ridge of Darband, is the town of Baisún. The town itself lies in a high valley, always cool, and shut in by mountains all round. After the expedition had crossed the ridge that bounds the cultivated oasis of Baisún on the east, there lay before their eyes the broad valley of the Surkhán, a copious tributary of the Amú-Darya.

Now one of the most important questions which the expedition has solved was this: "Is there any such river as the Surkhán?" On very many maps the Tupalan or Tuplang,‡ is indicated as the most westerly affluent of the Amú-Darya (if we omit the Sherábád River, which does not always reach the Oxus). The river first appeared on Burnes's map,

* [? "Hunger-Steppe."]

† Hwen Thsang (see *Pèlerins Bouddh.* ii. 22-24), after quitting the territory of Samarkand, proceeded, as he relates, in a south-westerly direction 200 *li* (about 100 *versts*), and then entered a hill-country where the way was rough and led along precipices. No habitations were to be seen, and no water or grass. After he had gone in a south-easterly direction through the hills for 300 *li*, he came to the Iron Gate. So they call (says he) the defile between two parallel mountains which rise on the right and left, and are of remarkable height. They are divided only by a narrow path, and that cut across by precipices. These mountains form on either hand lofty walls of stone, having the colour of iron. Here has been set up a folding gate lined with iron. To both valves of the gate are attached a multitude of iron bells, and because of these circumstances and of the strength and difficulty of this pass it has received the name which it bears. Thus far Hwen Thsang. He and other Chinese authors place the Iron-Gate on the northern frontier of the old empire of Tukhára, which extended 3000 *li* from east to west, and 1000 *li* from north to south, so that it must have included the Hissár territory.

Yakúbi also knows the Iron-Gate under the Persian name of Dar-i áhan which he translates correctly by the Arabic Báb-ul-hadíd. With him it is the name of a town, which he places to the north of Balkh and in a line with Kesh and Nakhsheb. Edrisi also (12th century), as rendered by Jaubert, locates at the Iron-Gate "a small, well-peopled town." In Ibn Haukál we find the following itinerary from Nasaf to Termedh, a place which is now called *Termis* and lies in ruins: Nasaf, Sunej, Dideki, Kandak, the Iron-Gate, Robáth (*i.e.* a shelter, probably here in the wilderness), Dárank, or Sárék, Hashmjird, and Termedh. If we allow 8 farsakhs to the march, and 8 versts to the farsakh the distance from Nasaf to Termedh will be about 450 versts (300 miles). From Samarkand to Kesh was reckoned two days' journey, and from Kesh to Kandak three marches.

The historians of Timur give the following route between Termedh and Kesh. In A. H. 801, on the 21st of Rajab (30th March, 1398), Timur crossed the Ámú with his army, returning from the Indian campaign, and remained the same day and next day in Termedh. On the 23rd he set out, and halted the night at Jahánsháh, on the 24th at Tarki; the 25th he passed through the Iron-Gate (Kohluga), on the 26th was at Jigdalik, the 27th at Kusi-mundak, the 28th at Dúz-Bilchin, the 29th halted at a brook, the 30th entered Kesh.

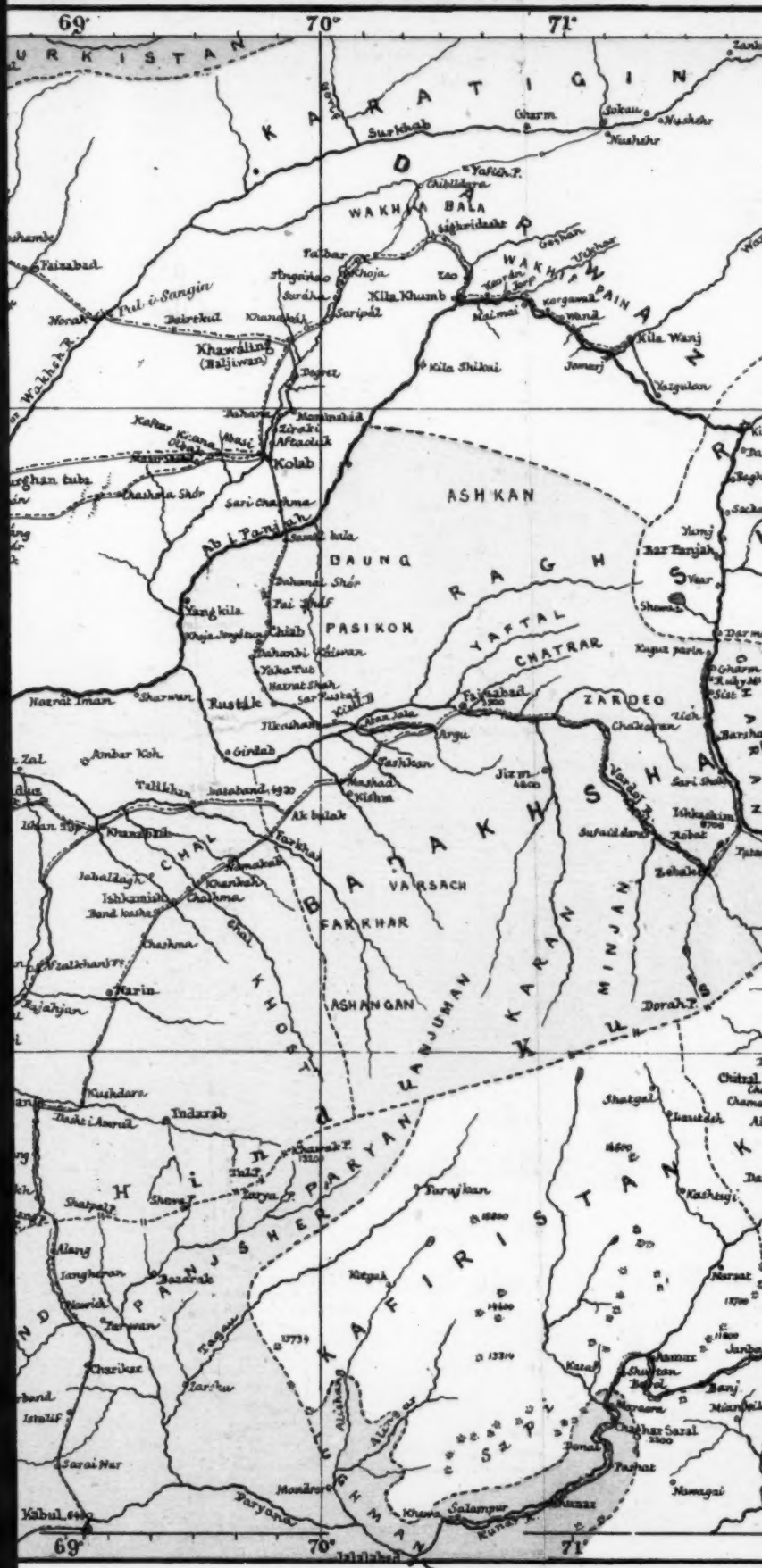
Clavijo (I make use of the 2nd edition, Madrid 1782, in 4to., a copy now belonging to me which came from the Sobolefski library) left Termedh, or Termit, as he writes, on Friday, the 22nd August, in the afternoon, and halted for the night in a plain near some great houses. On Saturday they passed through thickly peopled localities, and halted in a village. On Sunday they dined in a great building where Timur on this route used to halt, but continued their march and halted on a plain by the side of a river. On Monday they dined at the foot of very lofty mountains, where there was a little palace adorned with glazed tiles. Over these mountains led a pass called the Iron-Gate. Here toll was taken on behalf of Timur for Indian wares. Clavijo heard that there had formerly been an iron door on this pass. The same day they went on, and passed the night in the open on a hill; on the next day, after they had taken their siesta in the vicinity of a nomad camp by a stream, they again halted in the evening on a range of hills, and after a short repose started again at midnight, and so arrived at the great city of Kesh at mass-time on Thursday, the 28th of August.

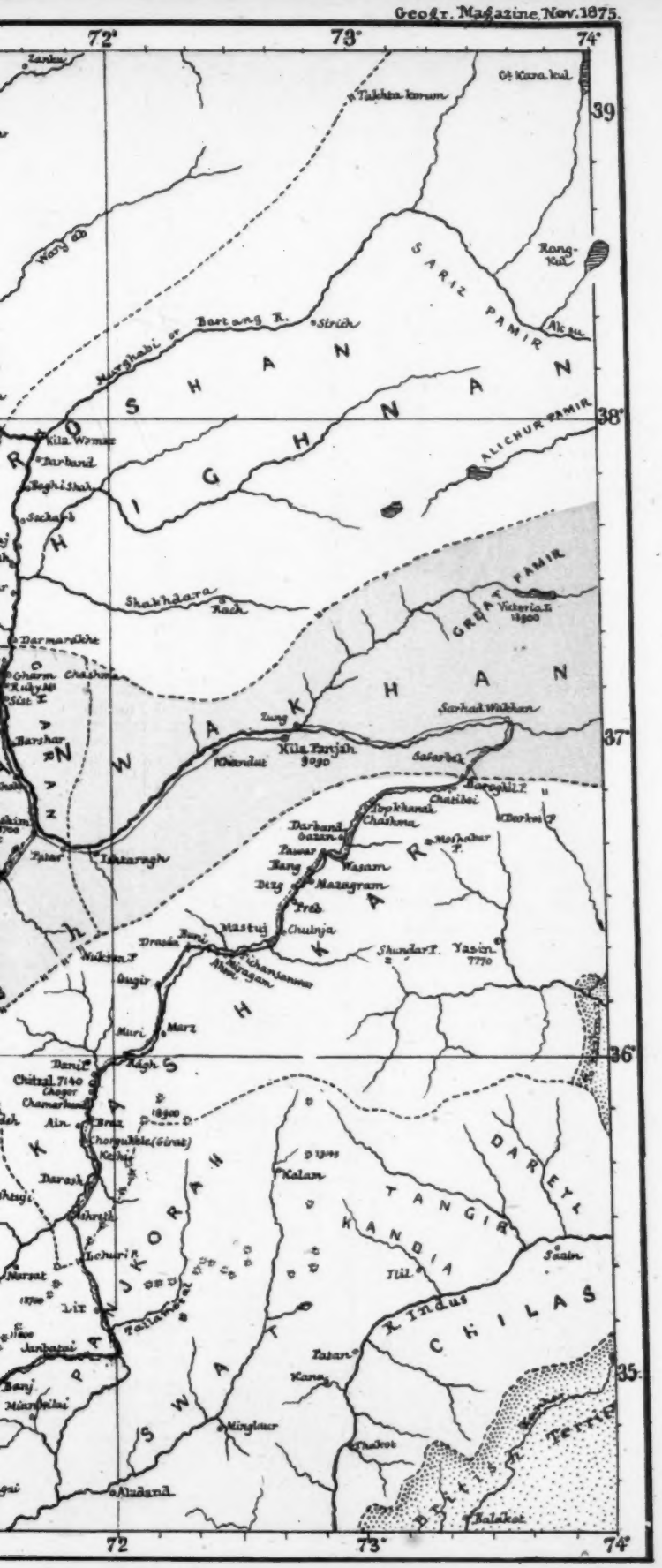
* We said above that in the 10th century the road from Karshi (*Nasaf*) joined that from Shahr-sabz (*Kesh*), one station distant from the Iron-Gate, at Kandak.

† *Tásh = Farsakh.*

‡ In the Tárikh-i-Rahim-Khání this river is called Tufalak or Tupalak. Along with it is named the river (Ab) of Karátágh. Rahim-Khán came with his forces on a Wednesday from Hissár-i-bálá (Upper Hissár) to the river Karátágh, and on Thursday to the Tupalak, where the fortress of Sar-i-Júi was then destroyed. Next day they went to the fortress of Dih-i-nau (new village), which, like Sar-i-júi, lay in the valley of Nihán.

Map of Part of
CENTRAL ASIA
SHOWING THE ROUTES OF THE
Russian Hissar Expedition,
THE
Havildar and the Mullah, 1874-75.
Principally from the last edition of
Colonel WALKER'S Map of Central Asia
BY
E. G. RAVENSTEIN, F.R.G.S.
Scale 1 : 2,000,000
Sta. Miles
Route of Russ.n Hissar Exped. (doubtful)
The Havildar's Route.
The Mullah's (Havildar's servant) Route
RUSSIAN TURKISTAN
BOKHARA
KARATIGIN
DARVAZ
WAKHAN
ASHKAN
DAUNG
PASIKOH
YAFTAL
CHATRAR
ZARDEO
BADAKHSHAN
VARSACH
FARKHAR
ASHNGAN
KAFIRISTAN
GHORBAND
PANJSHER
KUNAR
LAGHMAN
Kabadian
Kolab
Rustik
Kundus
Khulm
Balkh
Khanabad
Taliqan
Faizabad
Jizm
Ishkashim
Zebak
Chitral
Kabul
Jalalabad
Khawaling
Kila Khumb
Kila Panja
Kila Wanj
Kila Shikni
Darband
Sirab
Shirabad
Kaliuk
Kaisur
Pitau
Kudukli
Tailakan
Kafirnihan
Surkhab or Wakhsh R.
Amu Darya
Oxus R.
Hissar
Karatagh
Faizabad
Kila Zal
Amber Koh
Talikhan
Ishkamish
Chahar Darra
Khanabad 1920
Argu
Girdab
Tashkan
Mashad
Kishm
Sufaid darra
Robat
Tatar
Ishtaragh
Sarwan
Hazrat Iman
Aiwaj
Kunda
Chardak
Khanabad
Argana P.
Shaibagh Ak P.
Hazrat Sultan
Ghazigak
Baghlan
Nahrin
Gori
Rajahjan
Robat
Heibak
Tashkurgan
Khinjan
Kilagai
Dasht i Amrud
Tadarab
Talikhta Sary
Goran
Desakh
Doab
Doab Maskani
Kara Kotal
Kamard
Dandan Shikan P.
Saighan
Ak Robat
Ramian
Zohak
Shibr P.
Kala Kharkar
Haji Jaka P.
Gardan i Diwar
Ghorband
Charikar
Istalif
Sarai Nur
Parvan
Koh Daman
Alishang
Alingar
Tagao
Farajghan
Kitgul
Nuristan
Kashtigi
Darash
Shatgal
Chitral 7140
Chagor
Chamarkand
Ain
Chorgukhtak
Kelkh
Danil
Dorah P.
Gugir
Muri
Lutkuh
Jamur
Janbatai
Miankalai
Asmar
Barg
Kotaf
Shutkai
Bagal
Kapasa
Chighar Sarai
Tashat
Jonal
Namagai
Alada
Khwaja Salamgan
Kunar R.
Laghman
Nijrao
Mandrawar
Paryan
Alishang
Alingar
Tagao
Kabul 6400
Jalalabad
Nimla
Gandamak
Lataband
Khurd Kabul
Tezin
Sang i Nawishta
Sang i Nawishta
Sang i Nawishta


69°
70°
71°
KARATIGIN
WAKHAN BALA
WAKHAN PAYAN
Faizabad
Khawaling (Haljiwan)
Kila Khumb
Kila Wanj
Kila Shikai
Kolab
ASHKAN
DAUNG
PASIKOH
YAFTAL
CHATRAR
ZARDEO
Rustak
Girdab
Argu
Jizm
Khandud
Talikhan
Ishkamish
Chahar Sarai
Rostak
VARSACH
FAKKHAR
ASHAN GAN
Kushdara
Indarab
Shatyal
Alang
Jangharan
Nazarak
Tarwan
Charikar
Sarai Nar
Kabul
Paryan
Monara
Salampur
Kunar
Jalalabad
Shatgal
Kashtoj
Narat
Barg
Nimagai
Chahar Sarai
Paghat
Tirajkan
KAFIRISTAN
PANJSHER
KOHISTAN
Ab i Panjshir
Ab i Kunar
Ab i Alishang
Ab i Laghman
Ab i Kabul
Ab i Surkhab
Ab i Kokcha
Ab i Warsaj
Ab i Yafthal
Ab i Chatrar
Ab i Zardeo
Ab i Shashkim
Ab i Minjan
Ab i Karan
Ab i Kunjuman
Ab i Paryan
Ab i Panjsher
Ab i Ghorband
Ab i Salang
Ab i Chal
Ab i Khoja
Ab i Baharak
Ab i Kokcha
Ab i Warsaj
Ab i Yafthal
Ab i Chatrar
Ab i Zardeo
Ab i Shashkim
Ab i Minjan
Ab i Karan
Ab i Kunjuman
Ab i Paryan
Ab i Panjsher
Ab i Ghorband
Ab i Salang
Ab i Chal
Ab i Khoja


72°
73°
74°
39
38°
37
36°
35
Takhta-karum
Ot-Kara-kul
Rong-Kul
SARIZ PAMIR
Aksu
Wakhjir
Bartang R.
Sirich
Murghabi or
SHANNAN
HIGHNAN
ALICHUR PAMIR
Kila Wrmuz
Barband
Sachaeb
Shakhdara
Rach
GREAT PAMIR
Victoria L.
15600
Darmarikht
Charm
Chashma
Kilik
Pass
Sarhad Wakhan
Zung
Kila Panjah
9050
Khandut
Safarbek
Baroghil P.
Chatibei
Topkhanah
Darband
Chashma
Darkut?
Bazar
Mosjeber
Tawar
Barg
Wasam
Dizg
Mazegram
Trib
Ishtaragh
Mastuj
Chuinja
Drasan
Buni
Shundar P.
Yasin
7770
Vakhan P.
Ghizr
Khandevan
Khuragan
Muri
Marz
Dasht
Chitral 7140
Chesser
Chanarkand
Ain
Broz
1930
Chorgukho (Great)
Kelkh
Darash
Kalam
9145
TANGIR
DARELY
KANDIA
Tilil
Sazin
Lohuri
Nursat
Lit
Talichtar
Indus
CHILAS
Tasar
Kana
Janjuni
Barej
Miandwlai
Minglaur
Thakot
Alladand
Balakot
KOHISTAN
SWAT

thence passed to Khanikoff's, and thence again to all the more recent maps of Hissár. Quite recently too, the idea that the Tupalan was an important river was strengthened by Faiz Bakhsh,* for he included it among the five great streams that joined to form the Oxus. Whilst Fedtschenko, in his notes on Yule's work just referred to, was already diposed to doubt the correctness of this view, holding the Tupalan for an insignificant stream, he also disputed altogether the existence of any such river as the Surkhán.

But the expedition has now established that the Surkhán is really a big river, and one of the most important affluents of the Oxus, whilst the Tupalan is merely a northern tributary of the Surkhán which flows past the towns of Sar-i-júi and Sari-i-Ásia.† Another important affluent of the Oxus is the Káfirnihán, which flows parallel with the Tupalan, and is separated from the latter only by the ridge of the Bábá-tágh.

In the valleys of the Surkhán and of the Kafirnihán lie all the towns of the (so-called) province of Hissár, with the exception of these two: Baisún, which, as has been stated, lies with its villages in a highland valley; and Shirábád, which is situated far to the south behind a broad mass of hills. We say *mass* of hills purposely, because the mountains in the west of the Hissár country do not form especial and well-defined ranges, but lofty plateaus rather, traversed by a tangle, as it were, of short ridges of hills.

Just as westward of Hissár the town of Baisún with its villages, thus occupies an isolated highland valley, so to the eastward of Hissár the town of Faizábád occupies a similar valley.

In the northern part of the Hissár territory the expedition visited all the towns of a certain importance, *e.g.*: Dih-i-nau, Yurchi, Sar-í-júi, Regar, Karatágh, Hissár, Kafirnihán, Doshamba‡ (on the Zihdi-Darya, a tributary of the Kafirnihán). The Kafirnihán River, near the little town of that name, is crossed by a bridge, which every instant threatens to come down by the run. But more difficulty is presented by the passage of the ice-cold Zihdi-Darya near the town of Doshamba. It was only by help of the experience of a native well used to such crossings, that the expedition was able to get over without mishap. They had a similar passage of the Kafirnihán to make in its lower course near Kobádián.

After the expedition had visited the town of Faizábád, which lies on the stream Ilek (a tributary of the Káfirnihán) in a valley shut in on three sides, they proceeded to the valley of the Surkháb, the source of which was discovered by Fedtschenko in the Alai Mountains under the equivalent name of the Kizil-sú ("Red-water"). According to the report of competent natives, the Surkháb does really rise in the Alai Mountains; and the expedition also visited that part of the Surkháb Valley respecting which Fedtschenko collected information, which he has adopted into his map of the Upper Ámú and Khokand, information which proves to be very just and accurate indeed. After the expedition had passed the night in the settlement at Norak, they proceeded up the river through a wild and narrow gorge, in which the path had to be followed over dangerous and slippery precipices, and crossed the Surkháb by the famous bridge of Pul-i-Sangín (the Stone Bridge). Here the Surkháb is hemmed between lofty and precipitous cliffs, which afford hardly 30 paces interval for its flow, and rushes down into the narrow gorge with a frightful roar. The bridge itself is only 10 paces in length, and is abutted on two projecting rocks.

We must remark by the way that the name Surkháb is entirely unknown in the Hissár country. The river is here known to the natives as the Wakhsh, but further to the north it does bear the name of *Surkháb*.*

* *Journal of the Royal Geographical Society*, 1872, vol. xlii. p. 465.

† [Surely the simple explanation is that the informants of both Fedtschenko and Faiz Bakhsh applied the name Tupalan to the whole river. The precision of river names, with a few exceptions, like that of names of mountain-chains, comes only of books and geographers.]—*Y.*

‡ [Doshamba = "Monday," and in the same territory Sidi 'Ali mentions a town of *Chihár-Shamba* = "Wednesday." Mr. Shaw's book on High Tartary enables us to explain this nomenclature; the weekly markets are held in the villages (so-called) on those days.]—*Y.*

* In the *Tarík-i-Rahim-Khání* the river is known only by this last name. Between it and the Ámú lies, according to this authority, the fortress of Kurghán Tapa, which must be therefore where the Wakhsh comes near to the main stream of the Oxus. In the geographical authorities of the tenth century the Wakhsh is called only Wakhsh-áb. Sir Henry Rawlinson in his annual address to the Royal Geographical Society of London in 1872 (see the *Journal*, vol. xlii. p. cxcix), gave an extract from Ibn Dasta's description of the Oxus, which is also given by the late M. Fedtschenko (too early lost to us) in his notes of the translation of H. Yule's essay. As the original of this passage of Ibn Dasta is now lying before me, it seems to me by no means superfluous to transcribe what he says regarding the Upper Basin of the Jaihún (as the Arab geographers call the Oxus). Ibn Dasta begins thus:—

"The *Jaihún* comes from the East, out of the Land of Tibet, and flows through the Land of Wakhán. In that region it is called Wakh-áb. It then flows into the country which lies above Balkh, and to the east of that city. It next takes a course from the south towards the north till it reaches Termedh; thence the author has described the Delta of the Jaihún he proceeds: it passes to Semm, then to Amol, and then to Khwarizm." After

"And a variety of rivers flow into the Jaihún. Among them is a great river which is called Wakhsh-áb, and comes out of the region above the country of the Kharlukh Turks. It flows then into the Land of Fámir, then into the Land of Rást, then into the Land of Komedh (Vallis Comedarum of the ancients); after that it flows among the mountains which lie between the territory of Wáshjird and that Canton (Rusták) of the Land of Khotl which is called Temliát. In this tract (*i.e.* where the river flows among mountains), there is a bridge which is known by the name of 'The Stone Bridge' (it has the same name in Istakhri and Ibn Haukál; and in Timur's history it is called Pulisangín (Persian) and Tásh-Kopri (Turki), both meaning the same). Over this bridge you pass from Wáshjird to Khotl; to the right of the river's course is the Land of Khotl, and to the left is the Land of Wáshjird. After this the river flows on to the extremity of Khotl; and pours itself into the Jaihún at the place called Mileh, above Termedh. In the Land of Khotl, which lies between those two rivers, is the mountain range which is washed on the right by the River Wakh-áb, and on the left by the River Wakhsh-áb; to the right of the Wakháb is the Canton of Upper Tokháristán known by the name of Bargin.*

"Among those (rivers falling into the Jaihún) is also the river which Rámid . . . (so Rawlinson reads in the B. Museum MS.; the reading seems to be Sámil or Sámid). This comes out of the land of Rást (again in the MS. Rásb) which is between the commencement of the Washjird territory and Saghánián, and then flows into the territory of Saghánián. Several rivers flow into this one which come from the mountains of Botm and of Senam, Nihám and Kháwar: they are called the Kam-rúdh, the Nihám-rúdh, and the Kháwar-rúdh. And the river Rámid flows to the extremity

* [All this will be quite intelligible if you understand that the speaker is looking *outward* and *up* the rivers; so that his right and left indicate just the reverse direction to what we should call the right and left banks.]—*Y.*

The extreme eastern limits of the expedition were the valleys of Baljuwán and Kuláb (not Guláb as Fedtschenko writes it). Baljuwán lies in a narrow winding valley, on the bank of a small but rapid hill-stream, which is called by the inhabitants the Surkháb. Somewhat further to the south this stream is joined by the Kuláb Darya, and the two united fall into the Wakhsh.* The valley of Kuláb is materially wider than that of Baljuwán. Though narrow and almost a gorge in its upper portion, it widens suddenly out to the south-west, and passes into the marshy, reedy, tigery flats of the Lower Wakhsh.

The expedition at first intended to advance to the point of confluence of the Wakhsh and Panj, in order to fix it astronomically. With this view they proceeded from Kuláb to the fortified town of Kurghán-tuba upon the Wakhsh; but here at last the members of the expedition began to feel the evil influences of climate to which they had been exposed. In Kurghán-tuba Mr. Vishniefski and the interpreter Kasbekoff both fell ill of fever. Two Cossacks and a Jigit were also prostrated with fever, and delirium. Mr. Vishniefski was at the same time suffering from rheumatism in the head and in the foot, the consequences of a chill which he had taken, in part from riding through the deep hill-streams, and in part from the cutting cold winds which blow out of the gorges.* Hence the expedition was compelled to change their plan, and instead of visiting the confluence of the Panj with the Wakhsh, they had to proceed straight to Kobádián, with a slender hope that circumstances might yet permit them to get to the mouth of the Wakhsh from the town last-named. Meanwhile at Kobádián Mr. Vishniefski got so much worse that his travelling further was out of the question. In order not to lose time Mr. Mayef sent forward Mr. Schwartz, the astronomer, with an interpreter, three Cossacks, and some Jigits to Baisun, in order to take astronomical observations and fix with absolute accuracy the latitude of that place. This was all the more necessary as Mr. Schwartz had already on the outward journey taken an observation at Baisun of the lunar occultation of the star K *Capricorni*. Moreover, Baisun was the terminal point of the first section of the astronomical portion of the work of the expedition. Messrs. Mayef and Vishniefski stayed behind at Kobádián, with two Cossacks and two Jigits.

The health of Mr. Vishniefski improved after some days, and the whole expedition then reunited at Baisun. Thence they took their homeward way by the Kaltaminar road to Shahr-sabz and Samarkand.

On the 13th June the party reached Shaar† after having spent forty days in traversing the territories of Hissár and Kuláb. On the 16th June they presented themselves before the Amír, who, the day before had come from Kitáb to Shaar, the ancient city of Timur.

The result of this expedition will be an accurate map of the territory of Hissár and Kuláb, based upon fourteen points determined astronomically by Mr. Schwartz. Throughout the journey Messrs. Mayef and Vishniefski made route-surveys, and the map of the country travelled over was plotted daily, with all the settlements and other points indicated. Also during the whole journey a special field book of route was kept in which the distances (in *Tash*) and the compass-bearings were exactly noted. Finally, the entomological collection made by Mr. Mayef has been made over to Mr. Oshanin to classify.

(A further and more detailed description of this journey is expected at an early date.)

Translator's Note.—Being, where I am, almost without needful books and maps, except the last edition of Colonel Walker's 4-sheet map of Central Asia, I do not attempt here any comment beyond the few explanatory notes with my initial. To me and to some others, these seemingly dry notices are of almost intense interest! No territory has been so baffling to our attempts at map-making as this, and no existing

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of the territory of Saghánián. and there joins the Jaihún above Termedh. The hill-country between the river Rámid and the river Wakhsh-áb is called Kowádián, and belongs to the government of Khotl. To the right of the Rámid, in the east of Saghániàn, and to the left of Washájird (same apparently as Wáshjird) there flow into the Jaihún also rivers which come from the south out of Upper Tokharistán.* They are called .... (here follow names of very uncertain reading which Rawlinson reads Fargham, Vartan, and Jilán). These are the rivers which discharge into the Jaihún. Above the land of Khotl and on the river called Wakh-áb, which comes out of the land of Tibet and forms the beginning of the Jaihún, gold is found in grains bigger than pins' heads."

The last remark of Ibn Dasta brings me to the conjecture that the Khiva people who told Peter the Great stories about the golden sands in the Upper Oxus region might have got the report from reading some ancient geography book.

As regards Ibn Dasta's notices of the Oxus sources they are no doubt of the highest importance; but I think Sir H. Rawlinson, in placing them so much higher than the notices of the region in question given by the other geographer of the 10th century, does injustice to the latter. In 1872 Professor de Goeje's edition of Ibn Haukál (Leyden 1873) had not yet appeared. It seems to me that this work and Ibn Dasta's, in relation to the Oxus, are admirably complimentary, the one to the other. For in regard to the Wakh-áb, Ibn Dasta is very brief and does not mention its first affluents; whilst Ibn Haukál also affords a variety of precious details on the itineraries of the Upper Oxus region. And I agree with the late Mr. Fedtschenko when he opposes the view of Sir H. Rawlinson that the Wakhsháb of Ibn Dasta is not the Surkháb. His Rámid seems to be the modern Kafirnihán. Mokaddasi, as I learn from a copy of the Codex Sprenger in Berlin, names besides the tributaries in Saghánián six tributaries of the Jaihún, viz., the river of Halbak, the Barbán, the Fárghar, the river of Andijárágh,† the Wakhsháb,‡ and the river of Kowádián.

It would be a task well worth the trouble to compile the whole of the notices that we possess regarding the Oxus Basin. Other labours render it impossible for me to undertake this now, or at any early date. Ardently we hope that we shall not have to wait long for Sir Henry Rawlinson's continuation of the brilliant monography of the Oxus, of which he gave us the commencement in the *Journal of the Royal Geographical Society* for 1872. The material in existence is far from being exhausted, though H. Yule's Essay, and Fedtschenko's additions to it, have contributed much that is valuable. P. L.

15*th August*, 1875.

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* [This part is to me quite unintelligible, and I can't but think there is some corruption of the text.]—*Y.*

† [My belief is, that we shall eventually be able to identify these obscure ivers with the Murghább, Wanjáb, and others entering the Panja on the right bank, in Shighnán and Darwáz].—*Y.*

‡ [If this is correct, the river of Kuláb cannot be identical with the small Surkháb, entered in John Walker's map (after Wood) as entering the Oxus opposite Yangkilá, as has been assumed in Colonel Walker's last edition of his four-sheet map. And the fact that we have here no mention of Khwáling, rather favours my belief that Khwáling and Baljuwán are *the same place*. (See *Geographical Magazine*, May, 1874, p. 52.) This idea I see Colonel Walker has not accepted in his late edition.]—*Y.*

* The natives of Hissár, Karátágh, Doshambá, and other places in the hills wear long fur tunics throughout the summer, and in spite of this suffer very commonly from rheumatism.

† [*Shaar* would seem to be a popular name of Shahr-sabz].—*Y.*

map will much help the reader to follow these somewhat tantalizing notices. The best for the purpose will probably be that published (from the Russian) in *Ocean Highways* for August, 1873. It is gratifying to think that we shall at last have descriptions, and, we trust, views, of such places as Hissár, Deh-i-nao, Kurghán-tapa, and above all of that famous *Stone Bridge* which was a landmark to geographers nearly 1000 years ago.*

It is disappointing, I must confess, to find that the precise site of the famous Iron-Gate has not yet been identified. Surely the name of the station Darband must point to it? For the famous barrier-city of Darband on the Caspian also was called, like these Transoxian Gates, the *Iron-Gate*, and *Kohluga*.† I miss also in this preliminary report any notice of another famous place, Chaghánián. The misfortune which cut short the work of the expedition deprives us too of the precise determination of the junction of the great Wakhsh River with the Wakhán River or Panja Oxus; and we look anxiously for their map, for comparison with the latest representation on that subject by "the Havildár." The certainty that we now have as to the true application of *Wakhsh-áb*, and the passages from Ibn Dasta which Mr. Lerch has quoted in his notes, as to the co-ordination of the two great confluents Wakh-áb and Wakhsh-áb, recall a note of my own which I will here partially repeat:—"This latter form Wakhsh seems to have originated *Oxus*, whilst Wakh is better represented by *Ochus*. And the evident confusions in classical geographers about the Ochus, which seems at one time to be a river of Aria, and at another time a great confluent of the Oxus, may have relation to these circumstances."‡

H. YULE.

BEECH-HILL, HADDINGTON, *October 8th*, 1875.

THE VOYAGE OF THE 'CHALLENGER.'

VIII.

ON entering Albany Pass, the naturalists were greatly interested in the remarkable appearance of the gigantic ant-hills scattered profusely about on each grassy slope. These ant-hills are red clay pyramids not less than 12 feet high, and they add much to the desolate appearance of the country.

Cape York, upon which is the settlement of Somerset, forms the north-eastern extremity of Australia and the southern limit of Torres Strait. The settlement was established, in 1864, as a place of refuge for shipwrecked persons, and it is still maintained by the Government of Queensland, the monthly mail steamers each way between that colony and Singapore making it a port of call. It is also of great advantage to the numerous small craft engaged in the pearl fishery, carried on in the neighbourhood of Osman's Reef and the Jardine River, and which is yearly becoming of greater importance. The settlement consists of half a dozen houses, and one of these is the only store in the place, the other dwelling-houses being those left behind by the detachment of Royal Marines when they resigned their post to the Queensland police in 1867; one of them is now occupied by the London Missionary Society, who have already established themselves on the south-eastern shores of New Guinea, having pushed their way from the islands in Torres Strait to the mainland.

There has long been a doubt as to the best position for a settlement in Torres Strait; the present site at Somerset being objected to as being out of the reach of sailing vessels passing through the Strait, and also, of a shipwrecked crew coming from any of the reefs near the main route through the Barrier Reef, by the north-east channel. The strong tides at the present anchorage will always necessarily prevent the visits of large sailing vessels, and it is reported that Hammond Island, whilst being close to the passage through which every ship is obliged to pass, has a good harbour on its southern coast, to the north-east of Friday Island; but as regarding the question of the healthiest situation, no other place in the neighbourhood can compare favourably with Somerset, exposed as it is to the full strength of the south-east trade, and having a less rainfall during the north-west monsoon than the islands on the straits: it is besides the most suitable for a cattle station.

It is very doubtful if Somerset will ever become a settlement in the true sense of the term, as there is not sufficient inducement to tempt men to take up their residence in the locality, the mere calling in of passing ships being very precarious. The soil is poor and not capable of much improvement; the country round consists of low, wooded hills, interspersed with valleys and plains of considerable extent, backed by the dull sombre vegetation so peculiarly Australian; the whole appearance being hot and dusty. During the stay of the 'Challenger' the naturalists added considerably to their collection.

On the 8th of September the 'Challenger' left Somerset, and anchored the same evening between Hammonel and Wednesday Islands. The following day they cleared Torres Strait and visited Booby Island. This island—so named from the vast number of birds of that species which frequent it for breeding—may be considered the western outpost of Torres Strait. It is but a rock, fringed by a narrow coral reef; but as the generality of ships making or clearing the Strait, sighted it, it became of some importance, and owing to its favourable position, a supply of provisions was generally left, for the use of shipwrecked seamen, deposited in a cave at the base of the cliff on the west side of the island. This store was renewed from time to time by passing vessels; but at the time of the 'Challenger's' visit a small quantity of biscuit only was found, and no water, so the supplies are not to be depended on. A chest or cask was kept on the island and labelled *Post Office*. In this a book was kept in which those who visited the island recorded the name of the ship with the date, &c., and before the mails became so regular, letters were left and taken charge of by the next vessel that passed, according to where she was bound. It was not the

* The true position of this bridge, near Norak, is that assigned to it by Fedchenko (see *Geographical Magazine*, May 1874, p. 51). And I am surprised to see that in Colonel Walker's map that indication has been overlooked.

† This puzzling term seems to be Mongol = Barrier, and to be the same word as Kalghan, the name given by Mongols and Russians to the Chinese barrier city on the Kiakhta road.

‡ See Essay prefixed to Wood's Oxus in 1872 (first issue, p. xxiii). Nothing in these remarks is inconsistent with Major Herbert Wood's speculations about the Ochus in the *Geographical Magazine* for September.

breeding season and consequently no eggs were obtainable.

From Booby Island the 'Challenger' made a straight course for the Arrou Islands, sounding on the way through the shallow Arafura Sea, which at one time, as proved by Mr. Wallace from the similarity of fauna and flora in Australia and New Guinea, formed part of a great continent when those two vast islands were united. On approaching the south part of the Arrou Islands, they ran into shallow water, which caused them to anchor for the night; and well they did, for the next morning they found themselves near some hitherto unknown and dangerous reefs. Having weighed and cleared these dangers, they anchored in Dobbo Harbour, off the village of Dobbo. This harbour is on the south-west side of the Arrou group, formed by the two islands of Wamma and Wokan, and affords secure anchorage in both monsoons. The village, which has some notoriety from its trade, is built on a sandy spit 2¼ miles within the harbour, the spit itself affording shelter to the trading vessels frequenting it, anchoring eastward or westward of it according to the prevailing monsoon. In the early part of the west monsoon several vessels from Sourabaya in Java and other places, visit the port. The trading season was nearly over when the 'Challenger' arrived, the last of the praus having left the same morning on their return to Malacca. The resident population are traders, Chinese and Malay, who, with their slaves and servants form a large community, and in the height of the trading season number about 1500. The principal business carried on is vessel and boat building: of the former, one of about 150 tons burthen was then nearly ready for launching, and a number of praus were preparing for the pearl and trepang fisheries that are carried on off the east coast of the Arrou group, between the end of October and the beginning of December, before the wet season of the north-west monsoon sets in.

The Dutch exercise a species of sovereignty over these islands through the Resident at Banda, who visits them periodically. On the 'Challenger' coming to an anchor, she was visited by two men in authority, having silver-headed sticks with the Royal arms of the Netherlands on them; they were severely dressed in European costume of a fashion long passed away, with the exception of the everlasting tall black hat; the individuals within these state dresses look exceedingly hot and uncomfortable; but immediately the official visit was over, the tall hat and the rusty-black tail coat and trousers soon gave place to the more appropriate, and decidedly more comfortable dress of the country. In the afternoon the principal traders (Malays from Macassar) and Dutch missionaries called on them. These missionaries are established at the island of Wamma, and on the north-west coast of Wokan: they have made some progress in christianizing the natives, but strictly speaking they are schoolmasters and not missionaries. Slavery to some extent still exists, although legally abolished by the Dutch Government.

The settlement consists of several thatched huts, which are not built on piles in the usual Malay fashion, but on the ground. The boats on the beach form a shelter for many of the inhabitants. Wokan is separated from Wanembai by a strait. A party landed on Wanembai close to some huts, and were received by the natives in a very friendly manner, accompanying the naturalists into the bush as guides, the paths being narrow, slippery, and tortuous. The native men are as dark as the Fijians, and only wear the tapa round the loins; the women were not to be seen; but if their looks were in any way comparable to the men, the visitors did not lose much by the omission. These people live in communities, several families residing under the same roof, the only separation being a low planking about a foot from the ground, denoting merely the boundary line of each household, and as they consume a large quantity of arrack, it may be presumed that the state of morality existing cannot be very severe. They gain their living by shooting the birds-of-paradise, which are greatly in demand by the Chinese, also by collecting from the outer reefs of the island large quantities of tortoise-shell, pearl shells and trepang; others are engaged in procuring the edible birds' nests (the nests of a species of sea-swallow) also in great demand by the Chinese. In the pursuit of birds-of-paradise they mount a tree near the spot where the birds congregate, and from this vantage shoot them with arrows having a knob at the end instead of a point, in this way stunning them, and preserving the plumage from injury. The Chinese purchase these birds for two dollars or five quarts of arrack, the natives generally prefer the barter, by which the dealers realize a larger profit. The tortoise-shell is sold at about fifteen shillings a pound, and the pearl shell for two. Some fine specimens of king birds-of-paradise were shot by the naturalists, and a botanical collection made.

The expedition left Dobbo on the 23rd of September, and reached Little Ki Island the following evening, having obtained two soundings between the groups of islands in 800 and 580 fathoms, green mud. As the largest island of the group was approached, several boats full of natives boarded the ship, but as they were all more or less afflicted with skin disease, they were soon cleared out. On anchoring at Ki Doulan this malady was found not to be so prevalent. The Rajah and numbers of natives visited the ship. The chief trade of the place is boat-building, for which they are locally famous. The natives are an active race, as they proved by running over the rigging like cats, in a manner that could scarcely be imitated by the seamen themselves. None of the women were to be seen; being Muhammadans, they are naturally and religiously jealous of them, and kept them out of sight. Some fine pigeons, weighing two pounds each, were taken.

Ki Doulan was left early on the morning of the 26th, and crossing the Banda Sea, in which a depth was obtained of 2800 fathoms, with a green muddy bottom, they arrived at Banda on the 29th. In the serial temperatures taken in the deep soundings, the same temperature, 37°.5 was found from a depth of 900 fathoms to the bottom, indicating that the Banda Sea is enclosed by a rim or border, with only 900 fathoms in its deepest channel. The Banda Islands are ten in number, lying near each other, the harbour being formed by two of them, the Great Banda on the south side and Gunong Api (Burning Mountain) on the north.

The largest island of the Great Banda group is thickly planted with the light-green leaved nutmeg trees, relieved by the dark-leaved, tall, canarie trees,

which were left to protect the more delicate spice trees from the strong winds when the forest was cleared for planting them. Large groves of cocoa-nut plantations and other trees make the whole prospect pleasing. The island of Gunong Api, with its crater summit 2200 feet high, rising in the centre, always emitting smoke. A party ascended the mountain, which, although steep, is not difficult of ascent: they took two hours in reaching the summit.

The town on Banda Neina is prettily laid out. At one end is the Dutch garrison, and at the other the Chinese, Arabs, &c. There are three piers running into the sea. The roads are in excellent order, being kept so by convicts: a row of green trees on each side of the road gives them a refreshing coolness.

An excursion was made to one of the largest nutmeg plantations, the Governor accompanying the party in the steam-pinnace of the 'Challenger,' while his canoe, gaily decorated and double-banked, attended them, the men keeping time with their paddles to the sound of tom-toms and gongs. The crew of the canoe tried their utmost to keep pace with the steam-pinnace, but in vain, and were reluctantly obliged to give up the race. The estates on which the spice is grown were formerly a Government monopoly, worked by slaves, but since the abolition of slavery the monopoly has been surrendered, and any one is free to clear the jungle and plant the spice-giving trees; but the scrub is so dense that it is difficult to conceive how the cost of labour in clearing can be made profitable, and few indeed undertake to do it, the addition to the cleared land being generally made in old and well-established plantations by extending the borders little by little yearly. The labourers are Javanese, who engage themselves for a term of years; but the enervating climate and the prodigality of nature, in furnishing food for a week by one day's labour, renders the coolie labourer indolent.

On the evening of the 2nd of October the expedition left Banda, and steered for a position in which it was stated there was a depth of 4000 fathoms; but as it was ascertained to be from a report of a Dutch officer some twenty years ago, when appliances for deep sounding were in their infancy, and as in a position about 5 miles from it the 'Challenger' found but 1450 fathoms, which would give an incline of one in two for 5 miles, the sounding is supposed to be erroneous. The disappointment at finding the water so shoal was great as the trawl had been let down previously to sounding with 4200 fathoms of rope; they were, however, repaid by a rich haul, in which were some pieces of drift-wood, leaves, and seed, showing that these vegetable substances are capable of becoming water-logged, and finally sinking to the bottom.

On the 4th of October the green hills of Amboina, another of the Dutch Spice Islands, was seen, and the ship anchored in the port the same day. Here a large depôt of English coal was found, and a convenient jetty, alongside which the 'Challenger' was secured and 150 tons taken on board.

The islands as a group are frequently known as the Clove Islands, and Amboina is the chief residence of the Dutch Government of the Molucca Islands. It is the largest of the group, being about 34 miles long north-east and south-west. The bay is formed at the entrance by two high points. There is an inner harbour suitable for small vessels in stormy weather, but the entrance to it is narrow, and the place itself very unhealthy for Europeans.

As Banda produces the best nutmegs, so Amboina produces the best cloves. Pine-apples were plentiful but no other kind of fruit was obtainable. During the stay of the ship the monthly mail-steamer from Sourabaya, calling at all the Dutch ports, arrived, but as no arrangements had been made to meet the contingency there were no letters for the 'Challenger.'

On the 10th Amboina was left, and, passing through Manipa Strait and the Molucca passage, Ternate, off the west coast of Gillolo, was reached on the 14th. The island is near the north end of the Dutch possessions and forms one of a group of ten volcanic cones which may all be seen at the same time. The slopes of the hills, which extend high up, are rich in cultivation, and produce a greater variety of spices than the other islands, the volcanic soil proving suitable for all: they were formerly considered the principal of the Spice Islands, but had ceased to be so from the destruction of the trees by the Dutch. They are, however, regaining their reputation for spice-bearing and nutmegs; cinnamon and cloves are grown to a great extent; pepper is largely cultivated, as also are coffee and cocoa: the sago-bearing palm flourishes in every part of the island. They also now produce what the others do not, and which is more thought of by the passing seamen, viz., a tolerably good supply of provisions, in sheep, fowls, vegetables, and a greater variety of fruit; pine-apples, oranges, lemons, bananas, &c., being plentiful in their seasons. Ternate is about 6 miles long. Tidone, another island of the group, about the same size, being the place of trade with New Guinea, numbers of birds-of-paradise were procurable.

The ascent of the volcano of Ternate, 5600 feet high, was attempted by the botanists, but they failed to reach the summit in consequence of the burning sulphurous earth and insecure footing.

Leaving Ternate, the expedition proceeded with fine weather and smooth water to the north-westward. The deepest sounding obtained in the Molucca Sea was 1200 fathoms, with a temperature of 35° 2′; and as the serial temperatures decreased gradually, this sea is open to the Pacific ocean to at least that depth. The temperature at 200 fathoms was nearly the same as that found near the Equator in the Atlantic, but the surface-water being several degrees warmer, the decrease is more rapid.

Proceeding through the passage between Banka Island, off the north coast of Celebes, and Bejaren Island, the positions of those and the neighbouring islands were fixed, and a sounding obtained in 2150 fathoms, red clay, when only 23 miles west of Maquiliere Island. The serial temperature proved that the water in the Celebes Sea is cut off from communication with the surrounding seas below 700 fathoms, the temperature of the water below that depth being uniform at 38° 6′, this agreeing with the observations of Commander Chimmo. On the 22nd of October another sounding was obtained in 2600 fathoms, when about 40 miles from the land of Point Pola, south coast of Mindanao, with the same result as to temperature. The next day the 'Challenger' anchored at Samboangan, Basilan Strait. Here they found a state of war existing between the Spanish and the

Sultan and several Spanish gun-boats were blockading the islands.

Leaving Samboangan on the 26th, they proceeded to Ilo Ilo, Panay Island, and on the way sounded in 2550 fathoms with a bottom temperature of 50°, the same as that at 400 fathoms. They arrived at Ilo Ilo on the 28th October, where they obtained a supply of coal. The town of Ilo Ilo is considered the second in the Philippine Islands; but in saying this it does not say much for the first, for it appeared a most miserable place, low and swampy, with every appearance of malaria abounding in the vicinity. On the 31st the 'Challenger' left for Manila, and arrived in that port on the 4th November, having passed to the northward by the inner passage east of Tablas and Mindora. The stay at Manila was sufficiently long to prove how very unsuitable a port it is for refitting a ship and recruiting the men; compelled as the ship is, to anchor at a distance of nearly 2 miles from the shore, with a temperature ranging from 75 to 85 degrees, with an oppressive atmosphere, the temperature of the water being constant at 82 degrees. The public houses open to the crews are dens of infamy, in which the men are hocussed, robbed and turned into the streets, without any chance of obtaining remedy, owing to the insufficiency of the police.

Of course Manila is well known as the capital of the Philippine Islands and for its celebrity in producing good tobacco, which is cultivated to the detriment of all other crops, the culture of it being obligatory, and for which, when produced, the cultivators are badly and uncertainly paid by the Government, who hold the trade in it as a monopoly; there has, however, been a great development in the growth of sugar lately. If the islands of this Archipelago were properly cultivated, they would become one of the largest producing countries in proportion to their size. The Chinese are the labourers: they are here, as at other places, looked on with a jealous eye, but although they are taxed beyond any other class, they thrive. The city is clean.

The 'Challenger' left Manila Bay on the 11th. The north-east monsoon was met 30 miles N.N.W. of Piedra point, at which position a sounding was obtained in 1050 fathoms, the temperature at the bottom being 36°·3, and as the decrease of temperature was gradual to the bottom it shows that this sea is open to that depth between Formosa and Luzon.

The 'Challenger' reached Hong-kong in safety on the 16th November, 1874, and, shortly after, Captain Nares received a telegram from England offering him the command of the Arctic Expedition, now making its way towards the North Pole under his command. The news, gratifying as it must have been, was the cause of much regret both to Captain Nares and to those with whom he had been associated for two years; Captain Nares himself would have preferred completing the task he had so successfully carried on thus far; and those with him, though well understanding the reasons of the selection of their chief as the leader of the Arctic Expedition, could not but feel sorry at their own loss, and it was with no slight regret that farewells were exchanged.

J. E. DAVIS.

RECENT JOURNEYS IN PARAGUAY.

(Continued from p. 313 of our last number).

Orography.—In considering the elevation or relief of the land in Paraguay, the general level of the lowlands in the west, and of the Chaco, may be taken as about 250 or 300 feet above that of the sea, and no part of the country appears to be much higher than 2000 feet. The eastern or Paraná side of Paraguay is, however, much higher than the western. A chain of heights, generally termed the Cordillera, runs southward through the middle of the country parallel to the Rio Paraguay and the Alto Paraná, ramifying east and west in some districts. A mass of elevated land in the west, isolated from the central chain by the lowlands of the Upper Tebicuary-mi and the Manduvirá, and another plateau in the south, which culminates in the Cerros of Santa Maria and Santa Rosa in the Missions, are the chief elevations besides those of the Cordillera. The northern portion of what is termed the Cordillera has no title to this name, since it proves to be distinctly a southern continuation of the broad plateau of Brazil. Where we passed along it between the sources of the Apa and those of the Ypané rivers, it is a broad height, curving and undulating gently on each side of the water-parting, averaging perhaps 20 miles in width, and a little over 2000 feet in absolute height, having a distinct western declivity, from the base of which the slope is gradual to the river Paraguay. The barometric sections which I have been able to make of this part of the country, and which, I believe, give the first approximately accurate representation of the height of this part of South America, were taken on two separate lines from the river to the summit of the plateau, and confirm this view; I have consequently ventured to name this part of the central heights the *plateau*—not the Cordillera, as formerly—of San José Amambaya. The more northerly section crosses the midst of the country, in which an apparently high range, termed the "Sierra de las Quince Puntas," is laid down upon the map of Mouchez, and others following this one; we certainly crossed no such range, nor were any conspicuous heights to be seen from the route, saving a few isolated outliers of the plateau in the east.*

Further south, between the heads of the Ygatimi and Xexuy rivers, the plateau narrows, and is properly

* In computing the barometric observations made for elevation, which consisted of simultaneous morning and evening readings of two standard George barometers, one noted by an observer in Asuncion, the other on the route, I have assumed the height of Asuncion as 250 feet above the sea: this height, giving a fall of about 1 foot to each 4 miles of the river, seems rather under than above the truth. In his Tables of Barometric Elevation (App. p. 607), Capt. Page gives Asuncion 182 feet above Buenos Ayres; Buenos Ayres 50 feet above the sea; Asuncion 232 feet above the sea; but in his Meteorological Tables (p. 609) Asuncion is stated to be 307 feet above the sea. The barometric readings taken recently in Asuncion, and extending over more than a year, will probably afford a more true approximation to the height of the capital. I take this opportunity to express a high opinion of the working of Captain George's barometer in this, perhaps its earliest, practical testing. After three months of the roughest cart travelling in the north of Paraguay the tube and cistern returned in perfect safety in their tripod case; the barometer was filled, generally twice a day, morning and evening, in the tent or in the open, under all sorts of weather, a satisfactory vacuum and steady readings being almost always obtained at the first trial.

termed the Cordillera of Maracayú; a high branch of this Cordillera running eastward, terminates in forming the great salto of Guayrá. In the centre of the country the heights are named the Cordillera of Caaguasú. As far as I have been able to learn, these are not so high as the parts more to the north. Between these and the portion known as the Cordillera of Villa Rica, a break occurs where the Tebicuary passes out from behind the central ridge, and the track from Villa Rica to Caaguasú lies over almost level ground. Seen from the village of Villa Rica the Cordillera of its name shows a knot of dark, densely-wooded summits, probably not far short of 2000 feet in altitude.

The southern Cordillera seems to fall back, curving round the head of the basin of the Tebicuary, and terminates in a series of bluff heights on the Paraná between the marshes of El Carmen and Encarnacion.

The isolated western heights of Paraguay embrace first a plateau, round the western corner of which the Rio Paraguay bends, at, and for some distance below, the capital, which stands on its north-western slope: on the other sides this plateau falls with a marked edge to the basin of the lagoon of Ypoá and northward to the valley of the Salado. On an average it is about 200 feet above the level of the Paraguay (or about 450 feet above the sea), but both on the northern and southern edges there are higher points, such as the cerros of Areguá, Ibitipané, and Piraju, and that called "de dos Cruces" over the village of Jaguaron. Its most southerly heights, beside the Paraguay, are the Lomas Valentinas, the scene of several battles, during the war, as well as between the Payagua Indians of the river and the first Spanish conquerors.

The Cordillerita, or Cordillera of Altos, on the opposite side of the Salado, has an abrupt face of wooded slope to the south-west, and is higher than the plateau just described, having probably 600 feet of relative height; to north-east it descends with many folds, enclosing beautiful valleys, to the Rio Pirébebuy. The heights of the plateau and the valleys of this Cordillerita are the most populous districts of Paraguay. At the head of the Salado or Piraju valley the Cordillerita turns abruptly to the east, and the corner is marked by two very conspicuous hills, Cerro Costa and Cerro Santa Tomas, rising above the village of Paraguari. The former of these cerros, measured by barometer, is 850 feet in relative height, or about 1280 feet above the sea (850 feet above station at Paraguari: the station, by levelling, being 177 feet above Asuncion). Azara gives the relative height of this hill as 370 varas, or 1023 feet. From the Cerros of Paraguari the ridge runs east as far as a steep ascent called Sapucai, which is crossed in the main track from Paraguari to Villa Rica, and there it turns again abruptly, terminating about 20 miles further south in the remarkable cone named Cerro Tatuquá, "the hill in the burrow of the Armadillo," so named because the upper portion of it rises in a perfect cone out of a wide crater-like hollow. Several high points occur along this southerly ridge—cerros Chircal, Chauri, and Apiragua; and on its eastern side, somewhat detached from the ridge, is the fine, sharp-topped hill of Ybitimi.

A very remarkable knot of hills named the Cerros Acaay rise west of the ridge just noticed, and form a prominent object in the view; they are covered densely with dark woods, and present a steep escarpment on every side: a deep basin or hollow is said to occur in the midst of the knot. This mass and the Cerro of Tatuqua, appear to be not less than 1500 feet in absolute elevation. Between Acaay and the Cordillerita north of it lies the great flat grass plain of Paraguari: from its level there rise two or three isolated and wooded hills of perfectly conical shape; the most remarkable of these are the Yarigua-á or Guasú and Yarigua-mi, two symmetrically formed cones, rising about 600 or 700 feet above the plain.

The hilly and stony district of Caápucu forms the southern division of these western heights of Paraguay. Immediately west of the Capilla there is a mass of hills, of moderate elevation, filling up the country to the edge of the marshes of Ypoá, and terminating on the south in a line of summits facing the Tebicuary. The Cerro of Santa Maria and the little chain of hills of Santa Rosa are the highest points of the plateau, which runs north-west to south-east between the Tebicuary and the Paraná at San Cosme. The plateau appears to be about 200 feet, the tops of the cerros 500 or 600 feet above the esteros of the Paraná, or from 900 to 1000 feet above the sea.

Population.—The more civilized population of Paraguay, which is confined exclusively to the western portion of the country, consists of a mixture of the Spanish settlers with the original inhabitants, a part of the great Indian race of the Guarani, who occupied the greater part of South America from the Orinoco to the Middle Paraná, and a small negro element, derived from the slaves imported in earlier times by the Spaniards. These elements are still to be found distinct, as well as in every stage of intermixture. Among foreigners the Italians, who carry on the greater part of the traffic of the river, and the business in the towns and villages, form a considerable part of the population along the river Paraguay.

The first census of the people of Paraguay is that given by Azara, from which we learn that in 1792 the civilized population of the country amounted to 97,480, of which number 5133 were Spaniards. In 1857, according to a census then reputed to have been made under the superintendence of the elder Lopez, the population had increased to 1,300,000. This number has, however, been disputed, and was said to be much exaggerated.*

There can be no doubt, however, that previous to the war, begun in 1864, the country was in an exceedingly prosperous condition, and the remains of now deserted habitations in every part of the country argue a very considerable former population. At the present time, decimated by the long war, and scattered partly by voluntary emigration to more prosperous districts of the Argentine Republic or Brazil, the civilized population of Paraguay does not appear to exceed 100,000.†

* In 1860 M. Demersey estimated the population at 600,000, which number he thinks rather over than under.

† From estimates made in, or given me by the chiefs of forty of the villages of Paraguay, their total population amounted roughly to 8800. Allowing that the remaining twenty-three villages have the same average of inhabitants, the whole village population of Paraguay (excluding the capital) at the present time amounts to about 13,800. Several more or less accurate estimates given me of the population of the districts belonging to some of these villages, give an average of rural population in

The greater part of the northern districts of the country are now almost uninhabited: the department of San Salvador, between the Aquidaban and the Apa, is a complete desert, excepting that the wild Indians from the Chaco have occupied the abandoned capilla, on the bank of the Paraguay. The districts of the Missions south of the Tebicuari are now also all but deserted, though the frequent ruins and plantations rapidly going back to a wild state show that the former inhabitants must have been numerous. The bulk of the remaining population has drawn in round the capital, the heights of the plateau of Asuncion and the valleys of the Cordillerita being the only really peopled districts of Paraguay.

The whole area of the eastern watershed of Paraguay, as well as some parts of the northern interior on the western side, are still in possession of the original Indian tribes, as free and almost as undisturbed as they were before the Spanish conquest. A good deal of confusion appears to exist as to the names and localities occupied by these tribes of Paraguay and the Chaco, a babel introduced by the Jesuit geographers, who set down on their maps, under the name of its chief, each rapidly changing section and subdivision of a tribe, till it is not surprising to find one author complaining that he cannot find room on his map to set down the names of all of them: but even in the most modern maps the names of tribe long since extinct are often conspicuously placed. The wild Guarani in Paraguay, at the present moment, are in two divisions nearly allied to one another.

The Canguás*, or forest people, occupy the dense woods of Northern Paraguay, and are found over the whole stretch of country which extends from the Aquidaban across the Cordillera to the Upper Paraná. They appear to be a mild inoffensive people, keeping themselves strictly apart, living in the densest part of the forest, cultivating a little mandioca, and subsisting by this and the chase, or by fishing in the rivers. Their arms are still the bow, or a short spear or ironshod pike. The seat of the chief of this tribe, I was informed, is at a hill, named "Quati," near the Aquidaban, but in what precise locality I was not able to determine.

The other division of the pure Guarani in Paraguay is that of the Guayanas (not to be confused with a non-Guarani tribe of the same name, which formerly inhabited the country east of the Uruguay), who appear to occupy chiefly the basin of the Munda-y, or the space between the Cordillera of Villa Rica and the Upper Paraná. Less barbarous perhaps than the Canguás, some at least of the Guayanas still profess the christianity they learned from the Jesuits, and have imbibed sufficient civilization to find it to be to their interest to work in the "yerbales." The two solitary villages on the bank of the Upper Paraná, Pirapitai or Villa de Azara, and Tacurapucú are peopled by these Guayana yerba workers.

There are several tribes shut in or embedded as it were within the Guarani area by some strange circumstance, which differ completely from the enclosing people in race, language, and customs. Of this class are the wandering Tupis, the old allies of the Mamelukes of San Paulo, and still the terror of the more peaceable Indians of the Upper Paraná; the Ibitirocays, another smaller tribe, visited last year by the Boundary Commissioners, who found them on the banks of the Santa Teresa tributary of the Upper Paraná, are also foreigners within the Guarani region, their language being totally different.

Passing over to the western side of Paraguay, we find the little remnant of the once great tribe of the Payaguás, a dozen or two Indians, settled in a few huts on the bank of the lagoon above which Asuncion is built. This tribe was the first to be encountered by Cabot in ascending the Paraguay, and its two divisions then held command of the whole navigation of the river; from them, indeed, it is supposed by Azara that the river, and thence the country, was named. After long years of conflict with the Spaniards, the Payaguas at length found themselves compelled, for their preservation, to enter into a sort of offensive and defensive alliance with the invaders (in 1740), and both tribes had settled under the shelter of Asuncion in 1790.

The Indians of the portions of the Chaco which border upon Paraguay Proper, seem to resolve themselves at the present time, into two chief tribes, the Lenguas (perhaps rather the Mbayas) north of the Pilcomayo, and the Tobas between that river and the Vermejo, and about its lower course. The name Lengua (their own name for themselves in Juiadge) was given to the tribe from the peculiar form of their *barbote* or chin ornament, which being in the form of a semi-circle of wood passed into a slit in the lower lip, gives the appearance of a hanging tongue. They are nomadic in habit, fierce and intractable, and devoted to the chase. Azara tells us that, in 1724, the nation was on the point of expiring, and that it was then reduced to fourteen men and eight women. Either, then, the Lenguas have attained a new strength, or as I think more probable, their name has passed over to other tribes than that which originally bore it, for the Indians called Lenguas appear to be very numerous at the present time. Two allied tribes the Guanas and the Mbyas, appear to have moved about a great deal between the Chaco and Northern Paraguay. At

each district of six times that of the capilla, or chief village, or of about 83,000 in all; adding 10,000 as the population of Asuncion, and another 10,000 as the estimated number of wild Indians within the limits of Paraguay proper, a total of 103,000 is obtained. Since making the above estimate, I have seen in the latest edition of *Behm's Bevölkerunp der Erde*, a statement of the population of Paraguay in 1873, ostensibly from a *census* taken in that year, which gives the following figures:—

	Men.	Women.
Under 14 years	39,507	46,572
From 15 to 24	15,083	45,567
Above 25 years	13,663	60,678
	68,253	152,817
Total		221,070

The only way in which such a census could have been easily made in the country would have been by obtaining returns from each department, collected therein by its "gefe" or chief: it is strange, therefore, that though I constantly sought information as to population from the "gefes," not one of them ever mentioned this census, though they were able to give approximately the number of people in their department. The only approach to a census that I heard of, in any district, was a numbering of the inhabited houses in the department of San Cosme, which took place in 1871. I may be mistaken, but the very minuteness of this census of 1873 leads me to doubt it, although the general idea it gives of the proportion of the sexes, according to age, seems to be correct.

* More correctly Caaigua; Ca, the forest; guá, pertaining to.

the time of the Conquest, the Guanas inhabited the Chaco from 20° to 22° lat., but in 1673 a large part of their nation crossed the Paraguay; of these one horde seems to have settled down north of the river Xexuy and in other places, and to have become permanent inhabitants; part also became incorporated with the Mbyas, a tribe which crossed from the Chaco to the Paraguayan side some years before the migration of the Guanas, and which during nearly a century was in constant warfare with the Spanish settlers, advancing sometimes nearly to Asuncion. In 1796, however, they retired to the north of the tropic.

The name of Lengua of the present day probably includes some part of these tribes, and their invasive instincts do not seem to have diminished: last year, about this time, a large body of them taking advantage of the unguarded state of the river frontier, crossed the Paraguay and occupied the greater part of the country between the villages of Concepcion and San Pedro, driving out 96 Paraguayan families.

The Tobas are also a nomadic race, but appear to congregate chiefly at present about Lower Vermejo, outside the Paraguayan area.

The name Guaycuru was that of a noble race of Indians, who formerly inhabited the Chaco opposite Asuncion, but the nation was completely destroyed before the beginning of this century. Although the name is still used in Paraguay to designate the Chaco Indians in general, just as that of "Camba" is applied to the Brazilians, or as we might use the term savage or barbarian, it has now no special application whatever.

Yerba.—Yerba*, or Paraguay tea, the well-known staple product of the country, is derived from the twigs and leaves of a bushy evergreen tree, which is scattered, more or less thickly, through the wild forests of the central Cordillera from north to south. The districts in which it is most abundant are hence termed Yerbales, and are named from their locality; the chief are the Yerbales of Chiriguelo and Tacurupytá in the extreme north; of Concepcion at the head of the Ypané; of Rosario and San Pedro, in the basin of the Xexuy; of Caaguasú and Tacurupucú, on the shed to the Paraná; and of Yuti and Jesus, in the south. The Yerba trade is a government monopoly. Having obtained a concession, the Yerba speculator may take his gang of peons to any chosen Yerbal: there he settles down during the time that the trees are in "season," or for the six months of summer and spring. The processes of gathering the twigs and leaves, drying these over a fire, and afterwards beating them into small fragments, and packing the tea thus prepared in hide-bags, are simple and rude in the extreme. At the present time Yerba is not a cultivated product in any part of Paraguay. In former times, however, the shrewd Jesuit missionaries, recognizing the great advantages and conveniences of having the Yerba close at hand, made large plantations of the tree about the southern reductions, and at Santiago, it is said that a grove of not less than 20,000 Yerba trees flourished at the end of last century. It is surprising that, considering the value of the product to Paraguay, no subsequent efforts have been made to extend the cultivation of Yerba; but it is probable that the tree yields a finer tea in its native state and habitat than when cultivated, as the Missions Yerba was not considered superior. The trees of the far northern Yerbales yield a finer tea than those of the south of Paraguay, and the Yerba of Chiriguelo is stated to be the best of all. From the difficulty of access to this remote Yerbal it has never been worked, and the Yerba of trade is chiefly derived from the districts of San Pedro and Rosario.

KEITH JOHNSTON.

* Often called Yerba-maté; the maté, however, is the gourd out of which the tea infusion is sipped, through a tube, with a punctured bulb at one end.

Reviews.

THE INNER LIFE OF SYRIA, PALESTINE AND THE HOLY LAND.*

As the wife of the distinguished African traveller, Mrs. Richard Burton comes before the public with very strong credentials. But she does not require any propping or backing up, she shines with no borrowed light, and she is quite strong enough to stand her own ground. The book in which she has made her *début* is professedly a book of travels, and gives us *The Inner Life of Syria, Palestine, and the Holy Land;* but the memorable places she describes "pale their ineffectual fires" before the warm interest inspired by Mrs. Burton herself. Whatever she talks about, and she touches on a multitude of subjects, her own individuality is uppermost; but she is so unaffected, and heartfelt in manner that no one would accuse her of egotism. Whoever reads her animated and suggestive sketches, lighted up as they are with an inexhaustible supply of enthusiasm, will agree that as an authoress she is a distinctly welcome gain. She comes upon us like a fresh and stimulating breeze, and to be in her company is to be braced up by "a nipping and an eager air."

She was well fitted for the work of accompanying her husband to Syria and sharing his expeditions. She could ride for hours in the saddle, handle a revolver, endure privations and fatigue, take the command of a camp if necessary, tend the horses, and look calmly on sights and sounds that would send most women into hysterics. These accomplishments go hand in hand with the utmost refinement and the highest cultivation; and it is this strange mixture of forces, the gentle and the strong, that gives Mrs. Burton the power to hold her readers in subjection. She tells us that this is her first "independent publication." She had previously assisted Captain Burton in bringing out *Unexplored Syria*, a work perhaps more interesting to severe geographers than to the unlearned understanding, and she has now done her best to give an account "of the inner life of the Holy Land in general and of Damascus in particular." With all her gift for outspokenness she is obliged to regret that she cannot present things exactly as she saw them.

"In the present day the press has settled into a certain groove: the English reading public have drawn four lines which represent

* *The Inner Life of Syria, Palestine, and the Holy Land.* By Mrs. Richard Burton. (London: King & Co., 1875.)

the height, length, breadth, and depth of what they will read, and who wants to be read, and to be welcomed, must write within those lines . . . Besides which, *noblesse oblige*. I have been received with open arms in the greatest intimacy, I have eaten bread and salt with all classes, I have been admitted to prayer in the mosque tribune, and to all the *vie intime*. I cannot put them under a microscope to make my book entertaining, but there is much that I can say and quite enough to give my readers a fair idea of Eastern life."

The first sight of Damascus is by no means captivating, and Mrs. Burton looked in vain for the renowned "hanging gardens." The safest thing seems to begin with a little aversion, and ardent attachment for the Holy City is sure to follow.—

"Viewed from a height, and in good weather, like Stamboul, its domes and minarets impose upon you; but driving in, cold and tired, the shaky trap heaving and pitching heavily through the thick mire and slush, the narrow streets nearly meeting at the top, filled with dirt and wild dogs, is, to speak mildly, not pleasant. The thoroughfares, indeed, are all so paved with awful stones, that if you walk they ruin your feet, and wear out a pair of boots a week; and if riding, you must think all the time whether your horse can possibly get over the next heap, or if he will slide, fall, and break your leg. The large slabs are like ice, and the small ones are like the pilgrims' peas of the old tale. With all this, although you may grow to love even the faults of Damascus, so that you would not have them otherwise, you do not appreciate the picturesque the first evening of your arrival."

Women who go to the East generally succumb to the climate, grow limp in mind, and lose all energy; but it would be difficult to imagine Mrs. Burton in any position that would quench her vitality or subdue her irrepressible brain. She was soon mistress of the situation, knew everybody and everything, and speedily became the recognized leader of the little mixed group that constitutes "society" in Damascus. When she went abroad she was accompanied by an escort of brilliantly dressed Kawwasses. At first she was vexed at the fuss, but she soon found out that pomp and ceremony have their uses in impressing the natives. "I learnt that my meekness was quite misplaced, and that it takes some time to know how to behave in a manner which will gain respect in the East, which is the very opposite of that in the West. What would be considered conciliatory, high-minded, delicate, and well-bred in certain cases, would here be only mistaken for cowardice, meanness, and half-wittedness." She gives us the benefit of her experience in the bazaars, tells us what to select, and how to bargain, holds forth on the use of divans—those simple and luxurious seats that it would be so easy to introduce into our houses—and instructs us in the making of coffee, "delicious, thick, and oily, with a sort of bubbly cream at the top." There has lately been a discussion on coffee and the correct art of serving it. Mrs. Burton could settle the matter at once. Besides cultivating the European residents, our Consul's wife had to receive the natives and to qualify herself in all the intricacies of Syrian etiquette. To avoid giving offence the utmost tact is necessary, besides an unlimited power of digesting stray cups of tea or coffee with every relay of visitors. Of course we have a chapter on harims, and details of conversations with the ladies whose ideas are bounded by the polygamous circle. The poor caged birds were delighted with their visitor and her pleasant manners, but it must have been a little difficult for them to understand the gospel of marriage in which only one wife figures in a household.

Crossing over Mrs. Burton's threshold, we have an interesting picture of her own domestic life on uneventful days:—

"My work consisted of looking after my house, servants, stables, and animals; of doing a little gardening, of helping my husband, reading, writing, and studying; trying to pick up a little Arabic, receiving visits and returning them, seeing and learning Damascus thoroughly, looking after the poor and sick of my village and its environs. There is also galloping over the mountains and plains, and shooting either on foot or horseback. The only time I ever felt lonely was in the long winter nights, for I don't like going to bed when the chickens roost, and companions were impossible; it was too dangerous after dark (in summer one can occasionally smoke a narghileh with the women at the water's side in a neighbour's garden). So I used to occupy myself with literature, and at first with music, which I grew to dislike. I often sat and listened to the stillness, and counted the only sounds—the last call to prayer on the minaret top, which was adjoining my study window, the howling of the wild dogs, the cries of the jackals in the burial ground on the mountain, the bubbling of the fountains, the hooting of the owls in the garden, the soughing of the wind in the mountain gorges, the groaning of a huge water-wheel in a neighbour's orchard. These sounds were occasionally broken by a free fight in the road below, to steal a mare or to wreak an old vendetta. Twice I have been called down to the door to take in some poor wretch and bind up his sabre cuts. These hubbubs are varied in the day-time by the whacks of sticks and the cries of pain from various wretched animals—dogs or what not—and the wrangling of women in the hammám or in the gardens."

Amid her studies and manifold occupations, Mrs. Burton found time to take a practical stand as the champion of dumb animals. She witnessed sights that made her blood boil, and on all sides she was met by a brutal display of neglect and cruelty. She resolved to put an end to such inhumanities, or at least to bring about a reform, and the people around her soon found she was in earnest. She had special qualifications for this civilizade. She practically understood the treatment of horses, and knew much better than her grooms what the poor creatures wanted, and she had an elective affinity for animals in general. Her pet plaything was a tamed panther, and she would even like to persuade us that the cry of jackals is musical! It appears that the world labours under a delusion about the devotion of Arabs to their horses. When they do condescend to take care of them it is for their money value, and not for any sentimental attachment. "If his own animal is in question he will do all he can for it, if it is another man's beast he will do 'less than nothing.'" Mrs. Burton showed her sagacity in her original and testing way of securing a good groom, a test that might be adopted at home.—

"'I will teach you for a week or a fortnight, and I shall be in the stable five or six times a day. If I see that the horses neigh and rub their heads against you when you come near them, I shall know that you are a good boy. If I see that their ears go back, or that they lash out or move away from you when you come near them, I shall know that you worry them whilst you groom them. When they have been out half a day if they turn a hair I shall see whether you feed them properly, or whether you steal the corn. If they like you, you stay; if they dislike you, you go.'"

What Lady Burdett Coutts has done at home in rescuing animals from oppression, Mrs. Burton has done in Syria. Night and day she looked after the animals, and brought everybody to book who ill-treated them. Her chivalrous ardour was well repaid, and for miles around she succeeded in establishing a reign of kindness. It was one long war against ignorance and temper, and only a woman of strong will and prevailing personal influence could have come off victorious. Indeed her ascendancy over the

natives and her insight into their character is closely akin to the influence exercised by Lady Duff Gordon over the Arabs of Egypt.

Damascus and its life represents one part of Mrs. Burton's book, and then we follow her on a desert trip—dressed as a boy, and passing for Captain Burton's son—to Palmyra. Later on she made a pilgrimage to Jerusalem and the Holy Places, and it is in this section that we get the best idea of her attainments, of the strength of her enthusiasms, and of her great capabilities as a traveller. Every page shows how widely she has read, how deeply she feels, and although fully aware of the trodden nature of the ground, she still contrives to give to her narrative all the force of freshness and originality. In theology, as in everything else, she wears her heart upon her sleeve, and speaks out fully. She is an "Old Catholic" and she tells us so, and her description of the sacred sites is of course tinged by the warmth of her belief. She is perfectly liberal to those who differ from her, or as she puts it, "whose brains are formed for disbelief." She has no desire to disturb the faith of others, far less to convert. "I wish," she says, "to write freely upon religious subjects, and as I respect all other religions, I require the same respect for mine." With a mind absolutely free from doubts, and untouched by the corrosive action of modern scepticism, this child of the True Faith prostrated herself at various shrines, and the description of her felicity is fervid enough to warm the coldest outsiders. There can be no doubt of the genuineness of her devotion, and of the real joy it gave her to find herself on hallowed ground; to look up every legend and tradition, and credulously to identify the sites so dear to pilgrims. "Not being used to living on sacred ground, you want at first to kneel down at every step, and you feel hurt because the people are walking gaily along, singing as if nothing had happened there. But you forget that these men live here, and that they would be kneeling all day long if they reverenced every sacred spot as you a visitor are doing." By way of contrast perhaps some readers may here be reminded of "Eöthen," the full unquestioning trust of one writer and the critical misgivings of the other. Pilgrims to Jerusalem, and all the world is tending there now, should make a point of taking Mrs. Burton's book. They will find all the hard work done for them, all the authorities looked up, and if they are of the same way of thinking, the satisfaction will be complete. Anyhow, they will secure a most instructive, cultivated, and sympathetic companion.

We have already spoken of the curious mixture of qualities in Mrs. Burton's character, and how her own "inner life" has a power of attraction as great as that of the "inner life" of the country she describes. The contradictory elements, however, are sometimes so extreme as to provoke amazement. A staunch Catholic and aristocrat, she brims over with generous notions of liberty. She is shocked at shams, shocked at the artificial ways of society, and the "cab shafts of civilization," and at the same time she has an unreasonable horror of the prosperous working-man, and almost goes so far as to believe in the divine right of kings. If we wish to see the fanatical side of her mind we shall find it in a dream, which came to her one day when, worn out with fasting and fatigue, she lay down to rest in a cave at Jerusalem. A great deal has been said about this dream, and a great deal has been thought that has not been said. In the company of a "Guardian Angel" Mrs. Burton is taken up to Heaven, where she obtains a sort of diploma to reform the world and redress its wrongs. On returning to earth she settles every public question, apportions the various thrones of Europe to sovereigns of her own choosing, visits the Pope, and has an interview with Queen Victoria. If Mrs. Burton would let it pass just for what a dream is worth it would stand simply as a curiosity; but she makes a great point of it, believes that her visions are prophetic and destined to be fulfilled. To ordinary people the phenomenon is easily explained. A nervous, impressionable woman, exhausted with fasting and attending church ceremonies, and a head full of politics, theology, and her husband's wrongs, falls asleep and naturally dreams of the things that have engrossed her. Mrs. Burton's admirers, who are so ready to follow her waking thoughts, can only feel astonished that any one so sagacious and capable, so brilliant and rational, could be a prey to superstition. Extremes meet, and while one portion of her brain represents the full blaze of civilization, another portion is steeped in mediæval barbarism! Other people less candid would have suppressed the dream, or given it for what it is worth; but our authoress is fearless and stands by it, and is willing to take the consequences.

It will be seen that Inner Life in Syria is full of the most varied interest, and the enthusiasms and vagaries of the writer add immensely to its charm. Mrs. Burton is truly a many-sided woman. All who read her first book will be anxious for a second, even although it should be adulterated with another dream!

VERRAZZANO.*

THE Italian Giovanni da Verrazzano has hitherto had the credit of having discovered the greater part of the coast of the United States, from South Carolina to 50° N. American historians and compilers of narratives of voyages and travels have been puzzled at the description of the route, but they have accepted the authenticity of the expedition without question. The account of it first appeared in excellent company, in the well-known collection of Ramusio (vol. iii. p. 420), and it has since been constantly referred to and described as an important voyage of discovery.

Mr. Henry C. Murphy now pronounces the alleged discoveries of Verrazzano to be utterly fictitious, and transfers their credit to the Spanish voyage led by Estevan Gomez. This is undoubtedly an important and very interesting question, and Mr. Murphy has brought so much learning to bear upon it, he has stated his case so clearly, and has argued each point with such logical precision, that his conclusions will, we think, be very generally accepted by historical students and comparative geographers.

The account of the voyage first appeared in 1556, in Ramusio, in a letter, purporting to be from Verrazzano himself to the King of France, who is said to have despatched the discovery ship. There is also a manuscript copy of the letter, forming an

* *The Voyage of Verrazzano:* a Chapter in the Early History of Maritime Discovery in America, by Henry C. Murphy. (New York, 1875.)

enclosure to a letter from one Fernando Carli at Lyons to his father at Florence, preserved in the Magliabechian library of that city. The letter of Verrazzano is dated from Dieppe on July 8th, 1524, that of Carli, sending it from Lyons to Florence, on August 14th, or 37 days afterwards. Mr. Murphy considers that these dates prove the Verrazzano letter to be fictitious. The pretended discoverer's letter would have been sent to Francis I. at a time when he was marching to Lyons on his way to oppose an invasion of Provence by the Emperor's army, but before he had reached that city, and consequently Mr. Murphy argues that it could not have been in Carli's possession in Lyons, at the alleged date. Moreover, there is in France no record of or allusion to any such voyage ever having been fitted out by Francis I. previous to the publication of Ramusio; and, if such a voyage had been despatched, it is morally impossible that it should not have been noticed. The same king sent out Cartier in 1534 and 1541, but on these occasions no allusion is made to Verrazzano, and in the mappemonde constructed for Francis I., in 1543, the line of coast is taken from the Spanish maps, as well as the names, and no use whatever is made of the alleged discoveries of Verrazzano. These discoveries are asserted to have been made for the French Government, yet it is clear that, during the next twenty years, no French official or writer had ever heard of them. Then again the statements in the Verrazzano letter are inconsistent with actual exploration. Mr. Murphy gives reasons for the conclusion that the claim for Verrazzano was not set up before 1529, a date subsequent to the coast of North America having been discovered by another explorer.

The letter in Ramusio is pronounced to be an attempt, by an Italian, to appropriate for one of his countrymen the glory which really belongs to a Portuguese pilot in the service of Charles V. Estevan Gomez, a native of Oporto, entered the Spanish service, went out as chief pilot in Magellan's voyage, but deserted and returned to Cadiz in 1521. The coast of North America was then unknown from South Carolina to Newfoundland, and Gomez was sent to make discoveries in that direction. He sailed from Coruña in February 1525, reached the coast of what was afterwards called Carolina, entered the mouths of the rivers Chesapeake, Delaware, Hudson, and Penobscot, and returned home with some captured natives. In short, he made the exact voyage which is attributed to Verrazzano. Now there can be no question as to the authenticity of the voyage of Gomez. It is established on the authority of Oviedo and Peter Martyr, who actually saw the Indians brought home by the explorer. The account of the voyage was published immediately afterwards, in 1527, with a map.

Mr. Murphy's conclusion is that the voyage of Verrazzano is entirely fictitious, and that the letter describing it was concocted after the publication of the account of the discovery by Gomez, in order to transfer the glory of it to a citizen of Florence. This is not the only instance of a literary fraud which has long been successful; but, sooner or later, the truth almost always prevails. Yet there really was such a mariner as Giovanni Verrazzano. He was a native of Florence, who became a piratical leader in the French service, and, at the very time of the alleged voyage, he was employed in another part of the world. He was eventually captured by the Spaniards, and executed in 1527. There is, however, no reason for supposing that Verrazzano himself was in any way accessory to the imposture.

FOUR THOUSAND MILES OF AFRICAN TRAVEL.*

THE renewed activity which of late years has been displayed in the attempt to suppress the slave-trade on the western and eastern coasts of Africa, has had the effect of concentrating the traffic on the land routes from the region of the Upper Nile towards the Red Sea. The want of a better knowledge of the extent of the trade and of the chief routes taken by the slave merchants is greatly felt. The volume now before us from the pen of the Secretary to the American Geographical Society is in great measure designed to supply this want, and it is particularly welcome at a time when a chance has served to kindle a fierce anti-slavery agitation throughout the country, and to show the need of exact information on the present state of the traffic.

The line of route along which the reader is taken lies for the greater part up the Nile, the lower course of which is tolerably familiar to readers of African travel, but the upper portion of which, on the contrary, few care to visit. Mr. Southworth (who travelled on behalf of the *New York Herald*) had first intended to make his way as far south as the head-quarters of Sir Samuel Baker, whose position was at that time critical. But the season proved to be unsuited for so formidable a task, and the expense likewise promised to be so considerable, that Mr. Southworth had to content himself with penetrating as far as between 11° and 12° N. latitude; that is, not quite halfway between Khartoum and Gondokoro.

At Khartoum, which is a converging point of many of the slave caravan routes, the author stayed for five months, and this afforded him a good opportunity for acquiring information. Though slavery is indeed legally dead, voluntary slavery still exists, and until the Koran is amended, and the religion of the Ottoman empire changed, perfect freedom is unattainable. It is characteristic of the usual class of anti-slavery speeches that they shirk this difficulty, one which, however, Mr. Southworth fully acknowledges. But there is nevertheless much cruel work which goes on which ought to be suppressed. To endeavour to reduce this to the form of statistics is of course a very perplexing task, but from many sources the author inclines to think that the export of slaves from the country lying between the Red Sea and the Great Desert is 25,000 annually, a number which, however, represents only a fraction of those who die before reaching the places of export. The vigorous efforts of Sir Samuel Baker to crush this traffic receive, we are glad to see, deserved approbation in this book, and confident hopes are entertained of the success of his illustrious successor, Colonel Gordon.

* *Four Thousand Miles of African Travel.* By Alvan S. Southworth, Secretary of the American Geographical Society. (New York, Baker, Pratt & Co.; London, Sampson, Low & Co., 1875).

In these days, when the direct pecuniary advantage to be derived from every project or expedition is so keenly discussed, more especially in England, it is very satisfactory to find that the discovery of the sources of the Nile has an acknowledged practical importance in the eyes of the ruler of the country. This was evinced in the course of a most interesting interview with the Khedive, which Mr. Southworth was fortunate enough to obtain. Mr. Southworth enlarges upon the topic in another chapter, and remarks that as those sources are the reservoirs whence flow the waters giving vitality to over thirty millions of people, without which Egypt would be an arid waste, and as the fickle inundations of the Nile are fraught with the most vital interests, it is highly important to acquire a knowledge of the laws which regulate its supply of water.

A very interesting chapter is an early one devoted to a general consideration of the position and prosperity of Modern Egypt, the capabilities of which, as regards sugar and cotton cultivation, are clearly enormous. Its financial position is, as every one is aware, considered by recognized authorities to be open to question, but there is no contesting the broad facts that since 1863 the country has emerged from an ignoble obscurity in which it was oppressed by crushing taxation, and thanks to the energy and patriotism of its most capable ruler, has achieved a position which may well cause envy and uneasiness at Constantinople. Mr. Southworth conveys a very interesting notion of the character of the Viceroy as well as those of some of his ministers with whom he held conversations, by circumstantial descriptions of the interviews.

To those who seek in works of travel something lighter than discussions on the political economy, geography, or history of a country, the present book will not cause disappointment, for besides giving a picturesque idea of Nile travelling, it abounds, especially in the earlier parts, with that quaint American humour which we have so relished in the pages of the *Biglow Papers* and *Artemus Ward*. A good specimen will be found in a description of the heterogeneous doses issued to feigning invalids among the native crew of the 'Dahabeah,' p. 67. The illustrations in the book appear to be reproduced by lithography from photographs, and both on account of the judicious selection of subjects (these being principally "types" of the population) and the capital execution, deserve mention. We much trust Mr. Southworth may have occasion at some future time to favour us with another as fresh and interesting a narrative of his travels.

THE INDIAN FORESTER.*

WE heartily welcome the appearance of the first number of the *Indian Forester*, edited by Mr. Schlich, the Conservator of Forests in Bengal, and published in Calcutta in July 1875. This excellent periodical will be the organ of the Indian Forest Department; and is intended to supply a medium for the interchange of ideas among Forest Officers, and for the record of observations and experiments. "Free, full, and unfettered discussion," says the editor, "is the very life of forest science and forest art."

The first number contains several valuable articles. The "Remarks on the Sunderbuns," by the editor, furnish some account of the low islands forming the delta of the Ganges, which supply Calcutta and several districts of Bengal, with timber, fuel, and thatching-grass. Mr. Schlich describes the process by which the Sunderbuns have been formed, their vegetation, and their yield of forest materials. The next article is on "Coomrie Cultivation," by Mr. J. L. Laird; and then follows a paper on the means of obtaining length of stem for timber, by Mr. A. Pengelly, a son of the eminent geologist, at Torquay. Mr. Baden Powell contributes a very interesting note on the Dehra Dún forests, which is followed by reports on the Mysore sandal-wood, and on the African gum-copal tree. The number also comprises reviews of books on forestry, notes and queries, and a section on *shikar* and travel.

We trust that the *Indian Forester* will have a long and useful career. The great difficulty for such undertakings, in India, is to obtain contributions with regularity and in sufficient number. But, judging from this good beginning, we believe that the editor will overcome the obstacles that surround the first launching of a venture of this kind; and that the *Indian Forester* will continue to receive the encouragement it so well deserves.

* The *Indian Forester*, a Quarterly Mazagine of Forestry, edited by W. Schlich, Ph.D., July, 1875. (Calcutta).

Cartography.

Educational Maps and Models at the Paris Exhibition.

THE number of maps exhibited during the Geographical Congress at Paris was exceedingly large, and the task of a reviewer was rendered additionally difficult as all maps offered for exhibition, whether good, bad, or indifferent, had been accepted indiscriminately, and were arranged by countries and not according to subjects. Several maps, which we now know to have been there, escaped our notice simply because they had been placed in some obscure corner or were hidden away in a portfolio. Others we were not in a position to examine with sufficient minuteness to enable us to pass an opinion upon them. For these reasons the present notice is necessarily incomplete, even as far as the Paris Exhibition is concerned, and it is so still more with reference to school maps generally, for many of the best amongst them were conspicuous at Paris by their absence only.

To begin with wall-maps, as one of the most indispensable articles of furniture in a school-room, it is satisfactory to be able to state that in their preparation more attention is being paid now to the physical features of the earth than used to be the case formerly. Sydow's wall-maps, the publication of which marks an epoch in the history of cartography, were exhibited, strange to say, in the Russian Department. O. Delitsch's orographical maps, which are printed on oil-cloth, without names, which can thus be inserted by a pupil undergoing examination, deserve a word of notice. They are accompanied by an elementary atlas of identical contents. Kiepert's physical wall-maps are amongst the best published, and have already been noticed in our pages. They combine tints for mass-elevations with shaded hills, which strikes us as being preferable to tinted contour

maps, such as have been prepared by Messrs. Streffleur and Steinhäuser of Vienna. Speaking of hypsographical maps, we feel bound to mention a map of France prepared at the Dépôt of Fortifications, and remarkable not so much on account of its novelty, but for the taste with which it is tinted. The lowlands are left white, and then follow four yellow tints, four green, and four brown tints. The glaciers are coloured blue. There were of course a number of school maps having the hills shaded in the usual style. Amongst these may be mentioned M. Wagner's map of Germany and Ziegler's map of Switzerland. The Swedish maps, by A. von Mentzen, have the hills shaded in black or brown, and the plains tinted yellow or green. They are very effective, but rather coarse. This, too, is the place for a passing notice of the maps prepared at Cavael's Photo-lithographic Institute at Weimar. They are photographed from models prepared by Mr. Raaz, and where the features of the ground are favourable to an oblique light, they convey a capital notion of the features of the ground—as witness a map of the Caucasus in the Russian Department. By tinting the plains, which has been done in several instances, the hills are brought out with still greater effect. In producing maps of this kind it is essential that the model should be correct. Unfortunately this is not always the case in the present instance. Reduced copies of these maps have been published in the shape of an "Oro-hydrographical School Atlas," and by procuring a copy of this, our readers, without going to the expense of purchasing the large maps, will be able to form an opinion as regards the universal applicability of this method to the production of maps. We feel certain that their verdict will not be favourable. Amongst French maps, those produced under the direction of M. Levasseur, one of the most ardent advocates for the introduction of geography into French schools, are deserving of favourable notice.

Merely as a curiosity we mention a map of France prepared by order of the Minister of Education. There are no names upon it, but each town, river or mountain is provided with a hook, to which the pupil is expected to attach a small tablet bearing the corresponding name. This arrangement strikes us as being very cumbersome. Delitsch's oil-cloth maps are far preferable for purposes of examination, and an excellent substitute for blank paper maps is supplied by Messrs. de Lorne and Plazanet (Hachette and Co.), who print their outline maps on enamelled metal, upon which names or other features may be inserted in pencil, and then obliterated. We fancy that these tablets might prove useful in a school. Their original cost is higher, no doubt, than that of paper maps, but in the long run they will certainly prove the cheapest.

There can be no doubt that one of the readiest means of conveying a notion of certain topographical or geographical features is afforded by models or pictures. Stereoscopic views or similar illustrations cannot therefore be recommended too strongly for the use of schools. A set of such, judiciously selected, and sold at a reasonable rate, ought certainly to find purchasers, not amongst the directors of schools only, but amongst the general public likewise. We saw several sets of illustrations at the Exhibition, but none sufficiently comprehensive to recommend itself for school use. In the Russian Department, which was particularly rich in educational appliances, we found likewise a set of lay figures, dressed up to represent different races, care being taken to render their features characteristic. If models of houses, of weapons and various utensils be added to these, a sort of Doll's Ethnological Museum might be produced at comparatively small expense, which would afford both amusement and instruction to the pupils.

Relief maps call for more than a passing notice, for their utility for school use is undoubted. They are superior to ordinary maps when it is desired to impart some knowledge of geographical nomenclature or of the most striking physical features. Attempts have been made, at various times, to combine within the compass of a small model, every topographical feature, from the snow-clad Alps down to the dunes along the sea-shore, These fancy models, however, deserve no encouragement. They not only fail to illustrate what their authors propose, but really propagate error, as features so various are never met with in such close proximity. It is far preferable to procure a few characteristic models on a scale sufficiently large to convey an accurate idea of certain physical features, and to give an insight into the structure of mountain regions, such as can certainly not be obtained from an ordinary map, in spite of the most elaborate and skilful hill-drawing. Above all, each school should be furnished with a relief map of the country within which it is situated. A model of that sort would enable the pupils to compare the objects in nature with those on the relief, and if a good topographical map be suspended over it, the master will be in a position to give practical lessons in the "reading of maps." This is a subject very much neglected, we are afraid, and this neglect naturally prevents really good maps from meeting that encouragement on the part of the general public which alone will render their production a profitable enterprise by enabling them to compete successfully with the trash which now swamps the market. Fortunately there is no lack of good models on a large scale, suited to educational requirements, whilst one of the environs of a school can easily be prepared from a good topographical map, such as the new sheets of the Ordnance Survey.

The large-scale models which we saw at Paris, and a few of which we shall mention, may be brought into two classes, according to the system on which they have been prepared. The first of these classes includes models made as near as possible in imitation of nature, and either coloured in a style more or less conventional, or not coloured at all. Amongst this class we may mention G. C. Winckler's beautiful model of the Bavarian Alps; a model of the Gulf of Cattaro, which shows likewise the configuration of the sea-bottom; Bardin's model of the Grande Chartreuse, Chambéry and Grénoble (1:40,000); A. Girard's environs of Grénoble (1:80,000); Maillard's Réunion, and Captain Pistoia's elaborate model of the Etna. The latter is in copper, a material not at all favourable on account of its dark colour, which does not afford light and shade, as is the case with plaster of Paris.

The second class of these models is built up from contoured maps, a method first introduced by the Austrians, we believe. On these models the country rises in steps, which is certainly not true to nature, and we feel bound therefore to warn against their multiplication, in spite of the facility with which they can be manufactured with the aid of a contoured map, a pair of scissors, and a few sheets of paste-board. If it appears desirable to introduce contours on a model, they ought to be indicated merely by lines or scratches, as is done on Bardin's model of the environs of Metz. Amongst representative models of this kind we may mention that of the region of the "Cirques," or amphitheatres in the Pyrenees, which is done in plaster, and those of the St. Gotthard and of the environs of Berne, which are produced from the Federal map of Switzerland. A fearful exaggeration of this style was exhibited by Baron Schluga-Rastenfeld, whose relief of France is a preposterous caricature of the truth.

We now come to relief maps on a smaller scale. These have been objected to on account of their conveying false notions with reference to the features of the ground. This objection we hold to be utterly groundless. It certainly is necessary to generalize in the case of these reliefs, and to exaggerate certain features at the expense of others of less importance. But the same thing has to be done in the case of ordinary maps; and as long as it is done judiciously, and as long as the features of the ground are represented characteristically, no objection will be

valid in the case of relief-maps which does not apply with equal force to reduced maps drawn on a plain surface. An inspection of the relief-map of France, produced by Mdlle. Kleinhans, under the direction of M. Levasseur, is amply sufficient to refute these and all other objections. It certainly is one of the best maps of that class which we have seen. The colouring is exceedingly tasteful, but its chief merit consists in the accuracy and faithfulness with which the various features characterising the surface of France and the neighbouring countries have been rendered. The information conveyed by this relief is certainly not to be obtained from ordinary maps, though these, as a matter of course, possess advantages of their own. The contrast between Mdlle. Kleinhans's work and a relief of France by M. Sanis, on about the same scale, is exceedingly striking. It proves clearly that mechanical skill alone is not capable of producing a relief any more than an ordinary map, and that in order to enable the modeller to generalize orographical features with success, his hand must be guided by knowledge and intelligence. Many other models on a small scale were exhibited, but only few of them call for notice. M. J. Bauerkeller's relief maps in blue and grey, are not only incorrect but very ugly into the bargain. M. Drivet has exhibited a series of relief maps embossed in paper, side by side with the original plaster casts, and whilst the latter leave nothing to be desired as regards sharpness, the former appear blunted, and none of the beauty of the originals can be traced in them. In fact, we have not hitherto seen any paper reliefs on a *small* scale which could be said to give satisfaction, and this is all the more to be regretted, as plaster or metal are not only cumbersome, but require to be coloured by hand, which considerably adds to the cost.

A few more educational appliances may be mentioned. M. B. de Chancourtois exhibited a very useful set of models and diagrams illustrating the most usual projections of the globe. There were of course numerous globes, besides armillary spheres and apparatus demonstrating the phases of the moon or the changes of the seasons, but none of these appeared to us to call for particular notice.

In conclusion we might say something about "geographical games," several of which came under our notice. A desire to teach our youth whilst at their play, which we fear will not be cheerfully responded to by those whom it is intended to benefit, found expression in a game entitled "L'Europe amusante; Jeu de Drapeaux." The amusement merely consists in this, that the players place the various national flags upon a map of Europe. Those who commit an error pay a forfeit, and unless some fun is got out of the redemption of the latter, we fear this "game" will prove rather dull.

E. G. RAVENSTEIN.

MEMORANDUM ON THE CENSUS OF INDIA of 1871-72. By *H. Waterfield* (Presented to Parliament 1875).

IN 1871-72 an attempt was made to take a general census of India at a given date, for the first time, but it was incomplete owing to the Punjab, Oudh, and Berar being omitted, as well as the Native States. Great credit is due to the gentlemen who arranged and superintended the difficult Census operations, and the names of Mr. Beverley in Bengal, Mr. W. Chicheley Plowden in the North-West Provinces, Mr. Neill in the Central Provinces, and the late Mr. Gover (author of "Tamil Folk Lore") in Madras deserve special mention. An account of their proceedings and of the results in connection with the Census, will be found in the Section on the Condition of the People, in the *Statement of the Moral and Material Progress of India for* 1872-73 (p. 121). Mr. Waterfield's memorandum also brings into one view the available particulars relating to the population of British India, in a series of 33 tabular statements with explanatory notes. It will be found useful for reference.

Log Book.

—:o:—

Lieutenant Egerton.—We announce, with great pleasure, the promotion of one of our Arctic explorers, now wintering in the far north. Mr. George LeClerc Egerton went out as sub-lieutenant of the 'Alert,' and at Godhavn he also undertook the important duties of paymaster. He was promoted to the rank of lieutenant on October 15th, and has been duly appointed as a lieutenant to H.M.S. 'Alert.'

The Whaling Fleet.—News has been received of the whalers, and we trust that they will all have arrived safely at Dundee before this number of the *Geographical Magazine* is in the hands of our readers. On October 12th, a letter was received, by a Danish brig, from the 'Active,' commanded by Captain Fairweather, dated at Holsteinborg, on the 21st of August. On the 22nd of June the 'Active' broke the fan of her propeller in the ice of Melville Bay. She, however, prosecuted her fishing in Prince Regent's Inlet, up to the 1st of August, when she proceeded to Holsteinborg to refit. She arrived in that port only a few days after the departure of H.M.S. 'Valorous,' and sailed to complete her fishing on the west side of Davis Strait on August 21st.

On the 19th of October a letter was received from Captain Deuchars of the whaler 'Jan Mayen,' dated on September 29th, off Cape Kater. The letter was brought home by the Norwegian whaler 'Harold Haarfager' which reached Stromness on October the 17th. Captain Deuchars reports that the fleet reached the south-west ice on the 30th of May, the "North Water" of Baffin's Bay on the 22nd of June, and Prince Regent's Inlet on the 28th of June. Owing to the northerly winds the land ice was broken up on the 14th of July, causing the fishing there to be almost a complete failure. The 'Jan Mayen' left Prince Regent's Inlet on the 20th of July, to proceed to the middle ice, and Captain Deuchars expected to be able to remain in Davis Strait until very late, as there was no ice on the coast. There had been very few whales seen, owing to the ice being very light, and a scarcity of food in the water. In fact last year more whales were seen in one day than during all this season. The whole fleet was spoken by the 'Harold Haarfager' between the 26th and 30th of September, and the following list gives the catches of each ship up to those dates:—

		Fish.	Tons.
'Arctic' (Captain Adams)		3	45
'Active' (Captain Fairweather)		14	95
'Nova Zembla' (Captain Loffleys)		7	50
'Erik' (Captain Walker)		5	50
'Polynia' (Captain Kilgour)		8	50
'Jan Mayen' (Captain Deuchars)		5	35
'Esquimaux' (Captain Yule)		4	20
'Ravenscraig' (Captain Bannerman)		2	25
'Victor' (Captain Nicoll)		5	20
'Camperdown' (Captain Gravill)		3	20
'Narwhal' (Captain McLennan)		4	20
'Intrepid' (Captain Soutter)		1	20
'Mazanthien'		2	10
'Harold' Haarfager 'Grönland'	Norwegian	0	clean

The Swedish Arctic Expedition. — The expedition under Professor Nordenskiold left Tromsö on the 8th June, and arrived at Novaya Zemlya on the 22nd. For some weeks they occupied themselves in making zoological, geological, and botanical researches. After being foiled, by the ice, in their endeavour to get through the Matochkin Shar, they sailed southward, and succeeded in passing through the Yugorsky Shar (the straits between Vaigats Island and the mainland of Northern Russia) into the Sea of Kara, which they found to be free from ice. They then sailed for the centre of the Yalmal peninsula, and the wind being light they were enabled to dredge, and make temperature observations; which tended to prove that no warm under-current exists in the Kara Sea. After penetrating as far as 75° 30′ N. latitude, they made for the Yenisei, which the Professor and his friends ascended by boat as high as Dudinka village, having on the 15th August sent back the "Pröven" to Norway, where she has since safely arrived. Professor Nordenskiold has since made his way to Tomsk in Siberia. He reports that he discovered a splendid harbour at North-east Island, that he found the mouths of the Obi and Yenisei quite free from ice, and though shallow he anticipates that the success of this expedition will result in the establishment of trade between Europe and Siberia, and enable the rich products of the latter country to find an outlet along her great rivers. Our readers may remember that Captain Wiggins endeavoured to accomplish the same feat last year.

The Victoria Nyanza.—The expedition sent out by the *Daily Telegraph* to explore the lake region of Equatorial Africa, under the command of Mr. Stanley, has achieved a great success. The explorer has marched over a new route from Ugogo to the shores of the Victoria Nyanza, has launched a boat on its waters, and has circumnavigated the lake, thus ascertaining its form and dimensions. Mr. Stanley left the usual road from the coast to Unyanyembe at Upwapwa, and reached the western frontier of Ugogo on the last day of 1874. He then struck direct north across an almost level plain, and, after several days of severe marching, most of the party were unable to move from hunger and fatigue. At Chiwyu, in the Urimi country, Edward Pocock, one of Mr. Stanley's English companions, died of fever, and several of his native followers had sunk from exhaustion on the road. At this place, in about the latitude of Ujiji, the waters begin to flow north; and Mr. Stanley discovered a river called on different parts of its course the Liwumbu, Monangah, and Shemeeyu, which empties itself into the Victoria Nyanza after a course of 350 miles. He followed the river, passing through the Usukuma country discovered by Speke, whose route was parallel to and a little to the west of that taken by Stanley. In one part of the valley of the Liwumbu there was a collision between Stanley's party and the inhabitants of Ituru. When hostilitities commenced, Stanley sent four parties from his camp in different directions, to seize upon all grain and cattle, and to burn every village they came to. The number of inhabitants killed was 45, and Mr. Stanley lost 21 men. He left the coast with 300 men, and, after this conflict there were 194 left. He had lost 120 from fatigue, fighting, and want of food.

In March the expedition reached Kagehyi, a port on the Victoria Nyanza, a few miles east of Muanza, the place first reached by Speke. By this time 28 more men had died, and 166 survived. Mr. Stanley put the boat together which he had conveyed from the coast in pieces, and, launching it on the lake, commenced his voyage of circumnavigation. Passing the islands of Ukerewe and Ukara, and Mazita, which Speke believed to be an island but which proves to be a mountain on the mainland, the explorer proceeded up the eastern side of the lake. His descriptions of the scenery, and of the character of the surrounding country, are extremely interesting. He reached the capital of Mtesa, and met there Colonel Linant de Bellefonds of Colonel Gordon's staff, through whom he forwarded a letter which has not yet been received. A telegram has since announced the death of M. Linant de Bellefonds in the Unyoro country, on his way back. The King of Uganda agreed to lend Mr. Stanley 30 canoes to convey his party across the lake to the western shore at the mouth of the Katonga River, and on April 17th Mr. Stanley left Murchison Bay, returning to his camp on the south side of the lake on the 4th of May, after an absence of 58 days. In the interval Frederick Barker, another of his English companions, and several African followers, had died.

Mr. Stanley's two letters, dated at Kagehyi on the 1st of March and 15th of May, came by way of Zanzibar, and were published in the *Daily Telegraph* on the 15th and 18th of October. His sketch map of the Victoria Nyanza has been placed in the hands of the President of the Royal Geographical Society. Mr. Stanley has proved himself to be a most resolute and determined explorer; and we very heartily congratulate his liberal employers on the great success he has achieved.

An evening will be devoted to the consideration of Mr. Stanley's discoveries at a meeting of the Royal Geographical Society, in November. Meanwhile, we publish a letter from Captain Burton, containing that eminent traveller's remarks and criticisms on Mr. Stanley's letters.

Mr. Major's Voyages of the Zeni.—In an important Italian work published this year in Rome, under the title of "Bibliographical and Biographical Studies on the History of Geography in Italy," by Signor Cesare Correnti, President of the Italian Geographical Society, we notice the following remarkable passage on Mr. Major's edition of the Zeno narrative:—"But, however solidly the authenticity of the voyages and of the narrative of the Zeno may be established, there still remain some obscure points with reference to which critical studies, which might lead to more satisfactory explanations, would not be useless; I quote for example the localization of the island Icaria which Forster, and now Major, will establish in the Kerry Islands, a conjecture which does not seem to me exactly to agree with the narrative of Antonio Zeno."

Where the "Kerry Islands" may be we are at a loss to guess; and therefore cannot say how far they may or may not be in harmony with the Zeno narrative; but in justice to Mr. Major we must say that neither Forster nor he has made any reference whatever to such imaginary islands. A century ago Johan Reinhold Forster

first suggested that the name of Icaria took its origin from Kerry in Ireland, but adduced no arguments from the narrative to confirm his suggestion. Mr. Major has, however, deducted abundant arguments to prove that Forster was right, which are not only in harmony with the Zeno narrative, but derived therefrom. The name, the point of arrival on the west side of the island, the conduct of the natives, who made signals by fire and smoke, the pursuit along the hill-tops and the howling of the strangers off the coast, and the movements of the fleet after leaving the island, all lead to the same conclusion. Indeed of the many puzzles in the Zeno narrative of which Mr. Major has supplied the solution, this of Icaria was perhaps the most difficult, and we cannot but congratulate Mr. Major on the success of his explanation. But after he has conquered such a difficulty, it is somewhat hard that the very essence of his explanation should be misstated, and that the misstatement should be made a ground for demanding further critical studies in order to render his labours on a subject which he has really effectually conquered, more complete and satisfactory. It is to be hoped that if Signor Correnti's work reaches a second edition, this remarkable mistake will be corrected.

Introduction of Casuarina trees into Aden.—Mr. Gerald Raoul Perry, H. M. Consul at Réunion, during a useful public career in the navy and in the consular service, has been distinguished for the zeal he has always shown in furthering useful projects in the interests of his country. When he stopped at Aden, on his way to Réunion last year, he was struck by the absence of all vegetation, and by the utter desolation of the place. On reaching Réunion he noticed the strength and hardihood of the *filao* trees (*Casuarina laterifolia*), and the idea occurred to him that they were peculiarly adapted to the arid soil of Aden, and that their introduction into that place might possibly be effected with success. Mr. Perry has now forwarded to H. M. Political Agent at Aden a case containing from 1000 to 1045 young Casuarina trees, and a good supply of seeds, with full instructions for sowing and treatment.

N. Mikluko-Maclai on the Malay Peninsula.—The object of M. Maclai's journey to the Malay Peninsula consisted in ascertaining whether there existed any traces of a Papuan population. He considered our present information on that point to be contradictory, though Crawfurd and Logan spoke of negro tribes living in the interior. There could be no doubt that the Sémangs were not Malays, though Newbold (*Political and Statistical Account of the British Settlements in the Straits of Malacca*, 1839, p. 377) identified them with the Yakung, who, in his opinion, are Malays.

M. Maclai took up his residence with the Sultan of Johore, who exhibited much interest in his guest's investigations, and promised to assist him as far as lay in his power. The commissariat of the carriers turned out to be the greatest difficulty, and as they live on rice, which is not found in the woods, it was impossible that each man should carry provisions to last for twenty days, the proposed duration of the excursion. The Maharaja strongly advised not to employ Orang-utang carriers, instead of Malays, as they were quite likely to abandon him in the woods on the smallest provocation. M. Maclai therefore started without any definite plan, his only object being to come into contact with the inhabitants of the woods and hills, which are known in Johore indifferently as Orang-utang (wood-men), Orang-buket (hill-men), Orang-liar (wild-men), Orang-raiyet (aborigines), or Orang-yakung, "a name of unknown origin and meaning," according to Crawfurd.

On the 2nd February, 1875, M. Maclai returned to Johore, after an absence of seven weeks. The results obtained by him were important though not final. The journey was exceedingly fatiguing. It had been begun before the termination of the rainy season, and the water sometimes reached to his waist. It took him thirty days to cross Johore from west to east, from the mouth of the Muar to that of the Indau, although a great portion of the journey was performed by boat. The dense forests, which frequently necessitated cutting a path; the swamps; the numerous rivers, which had to be crossed by bridges or ferries of his own construction; the necessity of building huts for the night's rest (for there were hardly any inhabitants), all caused much delay. From Indau M. Maclai returned to Johore-Baru by land, which took twenty days. In the course of his journeyings he frequently met Orang-raiyet and Orang-utang, and had an opportunity of entering into relations with this primitive people, who are doomed to extinction, for Chinese and Malay settlers are pushing into the interior, and as the Orang-utang show no inclination to alter their mode of life, they will either disappear altogether, or be absorbed by the Malays.

M. Maclai feels convinced that the Orang-utang of Johore, though by no means a pure race, exhibit traces of a mixture with some other race, non-Malay, and probably Papuan.—*Istv. Russ. Geo. Soc.* xi., Part 2.

The Longitude of Teheran.—Colonel Stebnitzki determined the longitude and latitude of Teheran whilst employed there in observing the transit of Venus. The latter was determined from observations of stars, the former by means of the telegraph, the point of comparison being Erivan, the longitude of which is known accurately from the Caucasian trigonometrical survey. The results are as follows:—

	Latitude.	Longitude E. of Greenwich.	
Russian Embassy	35° 40′ 50″ 81	3h. 25m. 40s. 61	51° 25′ 5
Indo-European Telegraph Station	35° 41′ 6″ 83	3h. 25m. 43s. 46	

The altitude was determined by means of thirty-seven barometrical observations. Corresponding observations were made at Erivan and at Baku, and the altitude deduced from them are 3740 feet, and 3663 feet above the Black Sea respectively, the mean being 3702 feet.—*Istv. Russ. Geogr. Society*, xi., Part 3.

New Trade Route between the Aral Sea and the Caspian Ports.—Some of the Russian papers mention that a certain mercantile firm proposes to explore the region between the Aral and the Caspian with the object of establishing a caravan route for the transport of fish, prepared on the shores of the former and exported across the Ust-Urt and the Mertvi Kulduk Bay to ports on the Caspian.

Correspondence.

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Mr. STANLEY AND THE VICTORIA NYANZA.

To the Editor of the "GEOGRAPHICAL MAGAZINE."

SIR,—I heartily congratulate the *Daily Telegraph* upon the choice of its gallant commissioner, and I only hope that the latter may succeed in carrying out the grand exploration which he has so worthily begun.

Nevertheless, it is my duty to warn your readers, as I did nearly three years ago, against accepting, without the gravest consideration, the statements put forward by Mr. Henry M. Stanley in the *Daily Telegraph* (Oct. 15th and 18th, 1875). The letters are evidently written in haste, and after much weariness of mind and body; and mature reflection combined with further experience, may introduce important modifications into the more permanent record of travel.

At length after ten years we are stripping the garb of fable from the Victoria Nyanza. I will not write the word Niyanza or Neeyanza, because the latter forms are hardly in accordance with the rule of the great South-African families of language, and because Mr. Stanley, although strong in the vernacular, proved in his first work (*How I Found Livingstone*) that he ignored the minutiæ of the speech, and that his ear must not be relied upon.* Far more competent scholars, Messrs. Wakefield and New, prefer to write the word Nyánja, even as Mr. Stanley would convert Mazita, into Majita. It is the same with "Mkali" for "Mk'hali;" nor must we accept "Ituru" until we are enabled to decide whether it is the "Utaturu" of Captain Speke's first map, a name which afterwards unaccountably disappeared from the charts. We must hear more before we adopt the "mangroves" twice mentioned as growing in sweet water; and, a far more important point, we cannot for a moment admit the dictum, "I am sorry to say that, if I am right, Speke is about fourteen miles wrong in his latitude along the whole coast of Uganda." My late companion's observations have been carefully checked by the highest possible authority, Lieutenant Cameron, R.N., and the gallant young officer found them generally right within a mile. In the same paragraph Mr. Stanley seems not only to trust in aneroids, but also to think that the longitude is an easier matter to settle than the latitude; while he has evidently not reflected upon the immense and variable amount of mirage and refraction which would result from using at noon the sea horizon of a "quiet lake" situated directly under the equator.

The Victoria Nyanza, I have said, is now assuming an intelligible topographical shape. We hear nothing of the three great outlets, the Napoleon Channel, the Luajerri, and the Mwerango (Merango) which for the last decade have disfigured our maps. We read for the first time of the important north-eastern influent, the Ugoweh, and of the great south-eastern feeder, the Liwumbu-Monangah-Shimiyu. These absolute gains to geography, one of them numbering 350 miles in length, are simply due to the energetic explorer. We find Mazita or Majita converted from an island to a headland by Mr. Stanley, who approached it from the east, whereas Speke's terminus Muanza (1858), was to west; and the reader of my *Lake Regions* (vol. ii., p. 214) will remember the doubts concerning its insular nature, which the accounts of the Arabs awoke in my mind. From information I was able to state that the "Jezirah," an ambiguous term, meaning equally *insula* and *peninsula*, can scarcely be called an island; and in my map Mazita is dotted towards the mainland. We are also relieved from having to believe in a sheet of water whose level was nearly 500 feet higher in the south (3740 feet) than in the north (3308 feet).* My friend Captain C. George has ably shown (*Daily Telegraph*, Oct. 18th) the provisional value of the last measurements, and this practised calculator states that "Mr. Stanley's result (3808 feet) agrees so closely with Captain Speke's that it must create a favourable impression on scientific geographers."

On the other hand, we are absolutely non-plussed by the statement of the Anglo-American Expedition that during fifty-eight days their brave little boat, the 'Lady Alice,' "had surveyed over 1000 miles of lake shores." And the editorial article (Oct. 18) adds that the "sea of rhomboidal outline" measured about 230 miles long by some 180 broad.† Of course these are round numbers and general assertions; but they are not the less puzzling. Mr. Stanley after leaving Kagehyi and embarking on the lake, bends for a short distance to the east and then turns directly northwards; thus cutting off a huge eastern slip, at least one-third, from Captain Speke's "dodo-like" form. In this matter his course nearly corresponds with the line which I laid down in 1859 (*Journal R.G.S.*, vol. xxix). The whole western and southern shores must remain they were, for here we have the careful latitudes and longitudes of the Speke and Grant Expedition (1860-63); and, finally the northern cannot, according to the explorer's observations, be removed far north. Yet Mr. Stanley gives his lake 1000 miles, when the whole circuit of Captain Speke's is only 680 miles (direct geographical); and the area of the new Nyanza 32,515 square miles (230 and 180), nearly equals that of the old, (40,000).‡ Here, then, is something wrong, unless the explorer, including every little projection and indentation of the shore, "bends, curves, inlets, creeks, bays, capes and debouchures of rivers," prolonged to 1000 miles what his map reduces, we will say, to 550.

Mr. Stanley has successfully proved, versus Major Long, that the Nyanza is even larger than I made it in 1859 (250 by 80 miles); it has become, in fact, one of the finest of inland seas in the world; but he has by no means been equally successful in establishing the theory that Captain Speke's Nyanza is a lake and not a lake region. He tells us baldly "They (the natives of Muwanda) gave us all the information we desired"—a very usual phenomenon amongst Asiatics and Africans. "Baringo" he continues, "they said, is the name applied to the people of Ugana to Nduru, a district of Ugeyeya, and the bay on which our boat rode, the extreme end of the lake; nor did they know, nor had they heard of any lake, large or small, other than the Nyanza." The Lake Baringo of Dr. Krapf and of Messrs. T. Wakefield and C. New (1865 and 1866-67) and the Bahári yá Pili (the Second Sea) *alias* the Bahári yá Ukárá (Sea of Ukárá) laid down by the two latter gentlemen, are not to be disposed of by the chance words of a few blacks. Mr. Stanley evidently knows nothing about the Baringo, except what he has seen in Captain Speke's map, the work, I may say it without indiscretion, of my friend Mr. Trelawney Saunders. In an earlier letter of more sober style, the traveller tells us, "I have questioned the natives of Uchambi closely upon the subject at issue, but no one can satisfy me—though they speak positively—whether the lake is one piece of water or more. I hear a multitude of strange names, but whether they are of countries or lakes it is impossible to divine, for the people's knowledge of geography is

* My article appeared in the *Geog. Review*, of May, 1873.

* A wall-map in the Royal Geographical Society makes the absolute altitude of the Nyanza 4700 feet: this is a mere error, as it applies to the eastern water the correction of 1000 feet which my late friend Mr. Alexander Findlay added from a pencil note by Captain Speke to the Tanganyika Lake.

† The reader will remember that from Arab information I made the sea of Ukerewe (Nyanza), 240 miles long by 80 broad (see *Lake Regions* ii. 212.

‡ Captain George has calculated the rhomboid at this figure upon the data of the axes, 230 and 180 miles.

naturally very superficial." Every African traveller well knows that the tribes with few exceptions are ignorant, except by hearsay, of the lands lying a few marches from their doors; and experienced men attach very little value to the term "boundless." We freely accept as truth all that Mr. Stanley sees, but by no means all that he hears. Indeed the shape of the Nyanza itself must greatly vary with the seasons. The traveller informs us, "The descent to the lake is so gradual that I expect to find upon sounding it, as I intend to do, that, though it covers a vast area, it is very shallow." And in another place we are assured, "In Iramba, between Mgongo Tembo (T'hembo)* and Mombiti, we came upon what must have been in former times, an arm of the Victoria Nyanza. It is called the Lumamberri Plain, after a river of that name, and is about 40 miles in width. Its altitude is 3775 feet above the sea, and but a few feet above (read *below*) the Victoria Nyanza. We were fortunate in crossing the broad, shallow stream in the dry season, for during the *Masika* or rainy season, the plain is converted into a wide lake." What more do we want to show that this is a lake- or a lagoon-region?

It appears to me then that the controversy which has lasted for so many years can hardly be held finally settled. The Nyanza has certainly been proved to be a vast sweet-water sea, but the collection of minor features cannot be said definitively to have disappeared. On the contrary, when the whole region has been carefully surveyed, we shall probably find large and wooded tracts which, in the wet season, cause the lands about the Eastern-head reservoir of the Nile much to resemble the parts lying near its mouth.

Of the Tanganyika we can only repeat that the mass of evidence, as it lies before us, suggests a dead lake during the aries, drained at times of flood by a northern affluent feeding the "Luta Nzige," and by a western outlet, the Lukuga, falling into the Lualaba. The latter question may even now have been settled by the gallant Lieutenant Cameron, concerning whom we may safely quote the old saw *point de nouvelles, bonnes nouvelles*. Ill tidings fly fast even in Africa, and the long silence of the last months fairly entitled us to hope, even as we wish, for the best.

RICHARD F. BURTON,

ATHENÆUM CLUB, *October 19th*, 1875.

THE ATTREK BED OF THE OXUS.

SIR,—Excuse my saying a word on your remark,† that in all probability the Tejend is the Ochus. In the first place, there is, I think, scarcely room for two rivers, *i.e.* Oxus and Tejend, to enter the Caspian between the great and little Balkhan Mountains *in separate beds*.

To this, of course, it may be replied that Strabo, xi., c. 7, states that according to some authors "Ochus is only to be regarded as an affluent of the Oxus," and that consequently the Tejend or Ochus probably joined the Oxus before that river reached the Caspian.

On the other hand, Strabo's remark that some geographers said "the course of Ochus was more southerly than, and entirely distinct from, that of Oxus," points to the Attrek as being possibly the Ochus. This also I think is indicated by Appollodorus styling it "the nearest river to the Parthians;" a description applying still more to the Attrek than to the Tejend. Then again, the lower course of the Ochus watered Hyrcania, and though it may be said the waters of the Tejend would have also passed through this country, by the Oxus-Attrek bed, its name should have been absorbed in that of the Oxus, which it must have met as an affluent, to the north of Hyrcania, and before it reached this country. On the other hand, since water would *in all probability* have only flowed from the Oxus into the Attrek, during the epoch of the summer floods, the Attrek would have flowed as a separate stream during six months of the year, and, in this manner the doubt which Strabo reports regarding the lower courses of Ochus and Oxus would be explained. During the low-water time, Oxus I conceive would have sent its waters directly to the Caspian; for the canal into the Attrek would have to be closed yearly (precisely as is done in Khiva to-day), and allow of the deposited sand being excavated and the bed being so kept clear for the reception of the fertilising water, at the date of the succeeding flood. Then again, in Strabo xi. c. 10, we have a complete knowledge of the rivers Tejend and Murghab (Arius and Margus). "The plains of Aria and Margiana are crossed by two rivers, Anus and Margus, which water them very abundantly," and then a reference is made to the deserts "which surround the plain watered by the Margus." This knowledge of the country in these localities is therefore directly contradictory of the doubt which existed regarding the lower courses of the Oxus and Ochus. And I cannot help thinking that the doubt only arose from the very curious way in which a canal was led through a narrow defile in the Kurrendagh, to aliment the head-waters of the Attrek, or rather of its affluent the Sumbar.—Yours faithfully,

HERBERT WOOD.

P.S.—There is a circumstance which if followed up might assist in tracing the identity of the Attrek with that river. Strabo xi. c. 9, says, "In the neighbourhood of Ochus now it is said the Macedonians discovered a spring of oil by digging." . . .

Compare this with Mr. Delmar Morgan's *resumé* of Stebnitzky's Report on Turkomania *Journal R.G.S.*, vol. xliv. for 1874, p. 221. "Twenty-four versts beyond there is another ford across the Attrek, *Yagly-Olum* (*Oil Ford*)."

H. W.

* Not to be confounded with Mgongo T'hembo the "Elephant's back," in the desert of Mgunda Mk'hali, a place far South. (See *Lake Regions, &c.*, i. 290.)

† In *Geographical Magazine* for October, 1875. Editorial note at page 304.

Proceedings of Geographical Societies.

BERLIN GEOGRAPHICAL SOCIETY.

WE have received the "Proceedings" of this Society at their meetings of the 3rd April, 8th May, and 2nd June. At the first of these an interesting paper was read by Freiherr von Troschke on the hydrographical changes which the coast lands of Holland have undergone. These he pointed out have been greater than those of almost any other land. For instance, at the time of the Cimbrian invasion the mainland was far more extensive than at present, and the Zuider Zee was an inland lake of moderate size, called Fledo, a name still recognizable in the island Vlieland. In the thirteenth century the greater part of this coast land was swallowed up by the sea, and in 1272 a similar fate overtook the land at the mouth of the Ems, where the Dollart is now situated. Since the flood of 1421 when the Biesbuch near Dordrecht was formed, no violent change has taken, and, owing to the increase of works of reclamation, the inroads of the ocean have been more regularly compensated for. As, however, the new land is in many cases as much as 12 feet below the level of the ocean, strong embankments have become requisite to guard against inundations. The Haarlem Sea, which the Prussians sailed across in the campaign of 1787, is now an extensive plain, with well cultivated and populous villages. A beginning has been made of the great scheme for drying up the Zuider Zee by the adoption of measures for drying up the Y. In its place there will be

a navigable canal, starting from the Dunes, by the North Sea, and the breakwaters at its mouth are fast approaching completion. One effect of this mighty reclamation will, in all probability, be to make the force of the tidal waves much more felt in the recesses of the coast to the north, such as Jahde Bay. In the same number we are favoured with a memorandum by Baron Von Richthofen, on the first instalment of geological maps recently issued by the Royal Geological Institute; a paper on the German Expedition for the observation of the transit of Venus at Ispahan in Persia, which was read by Herr G. Fritsche, at the 8th of May, and a full account of the meeting of the 2nd June, together with a reprint *in extenso* of the interesting paper read by Dr. Nachtigall, on his explorations in Central Africa.

MEXICAN GEOGRAPHICAL SOCIETY.

WE have received the "Proceedings" of the Geographical Society of Mexico for 1874-75. Citizen Ignacio M. Altamirano, the indefatigable Secretary, continued at his post, and the President, as provided by law, was the Minister of Public Instruction. The meetings took place every fortnight, and several interesting papers were read. The most important were on the geology of the district of Xochitepec, a few leagues south of the city of Mexico; on the geography and statistics of San Luis Pot si, and on the famous aerolite of "La Descubridora." The annual address, on April 28th, 1874, the 23rd anniversary of the foundation of the Society, was delivered by the mining engineer, Santiago Ramirez.

Mr. Clements R. Markham, C.B. and Mr. Maurice Kingsley were elected Honorary Members of the Society.

"COSMOS," No. 1 OF 1875.

SIGNOR CORA'S periodical opens with a proposal for the establishment of an Italian Hydrographical Office in connection with the Marine Department. He draws attention to the increasing importance attaching to scientific research by means of such expeditions as those of the 'Lightning' in 1868, the 'Porcupine' in 1869 and 1870, the 'Challenger,' the United States vessel 'Tuscarora,' and the 'Gazelle,' belonging to the German Navy. He also points out the delay which has attended the publication of the results of the expedition of the 'Magenta' in its voyage round the globe from 1865 to 1868, the natural history being even now the only branch which has been published, the hydrography still remaining uncared for. Similarly, through lack of a central department, charged with the duty of seeing to the publication of results, the careful journals and minute observations taken on board the 'Princess Clotilde,' 'Vedetta,' 'Vittor Pisani,' and 'Governolo,' lie unused in office pigeon-holes—a course which, as Signor Cora truthfully points out, involves a sheer waste of nearly all the money laid out in the expeditions themselves. He earnestly trusts that the voyage of the 'Garibaldi,' honoured as that vessel was with the presence on board of Prince Thomas of Savoy, may be the occasion of following the worthy example of England, France, Germany, Russia, and Austria, and creating an institution of the kind referred to.

The next two articles are a notice of H.M.S. 'Challenger's' voyage from Australia to Manilla, being the substance of a paper read by Professor Wyville Thompson, before the Royal Society, on the 4th February last, and an account of the levelling operations effected by Colonel Tillo, between the Caspian and Aral Seas.

The most important article in the present number is an account by the editor himself of his recent journey in Albania. Signor Cora remarks upon the anomaly that an European country should be indebted to foreign nations for charts of its own coasts, and to private travellers for very sketchy maps of its interior territories. The best map of the parts traversed by Signor Cora is Kiepert's Thessaly and Epirus, in two sheets, scale, 1:500,000. But this shows several blanks, and it was with the view of filling these up that he undertook his exploring trip. Before crossing the Adriatic he spent two weeks at Brindisi, in examining the harbour and its approaches, and came to the conclusion that there are many improvements necessary before this port can take its proper rank as one of the best and safest harbours of the Mediterranean. He then took passage in a small Turkish craft, and landing at the entrance of the Voiuzza River, made his way on foot to Valona, a pretty, but low and unhealthy town. After spending a week here, making preparations Signor Cora made straight for the interior. On the third day he ascended Mount Kudusi (6265 ft.), a conspicious landmark for miles out at sea, which is not laid down on Lehnert's map. After visiting the ruins of the ancient Amantia, he travelled on to Berat, the most important city in Epirus after Yanina, with a population of about 10,000 souls. An ascent of the Lumi Beratit or Semeni River brought him into the district of Colonia, where the soil is fertile and the population numerous. Notwithstanding the fact that the district is over-run by a powerful band of brigands, Signor Cora managed to avoid them and execute a careful survey, which was much needed, as Pouqueville and Barth's researches had given a very incorrect impression of the country.

At Yanina, whither he journeyed southward, he made an examination of the lake, and found that its average depth was only 16 feet, though the inhabitants of the town avowed it to be as much as from 15 to 20 fathoms. Going on from thence to Corfu, Signor Cora hired a yacht and explored many of the anchorages and harbours in the vicinity, noting various modifications in the English Admiralty Chart of 1865 by Captain Mansell. Having received from Italy a supply of better instruments, he returned to Yanina by a northern route through an unexplored country, but the rains came in such abundance as to render surveying a matter of great difficulty. At Yanina Signor Cora received a courteous offer from Mustafa Assim Pasha, who had already materially aided the exploration, to accompany him to his new post at Tripoli, in a Turkish man-of-war. This offer Signor Cora gladly accepted, and remained at Tripoli till December, accumulating a stock of information respecting the oases of the desert, and the trade-routes to Wadai and other places.

Signor Cora proposes to publish, in three separate instalments, the detailed scientific results of his journey. He will also eventually publish a large-scale map of Lower Albania, from his own surveys, on the scale of 1 : 100,000; but this will not appear for some years, as it is to be supplemented by further exploration.

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